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M E D I C A L
T R A N S A C T I O N S.
VOLUME THE FIRST.

MEDICAL



TRANSCTIONS

VOLUME THE FIRST

1776

MEDICAL TRANSACTIONS,

PUBLISHED BY THE
COLLEGE OF PHYSICIANS

IN
L O N D O N.

VOLUME THE FIRST.

THE THIRD EDITION.



Academy - Royal College of Physicians

L O N D O N:
Printed for J. DODSLEY, P. ELMSLY, and
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MEDICAL
TRANSACTIONS

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COLLEGE OF PHYSICIANS

IN
Jos. Banks

VOLUME THE FIRST
THE THIRD EDITION

LONDON:
Printed for J. Dodson, R. Baskin, and
J. Baskin and Son, in the Strand.



ADVERTISEMENT.

THE experience of many ages hath more than sufficiently shewn, that mere abstract reasonings have tended very little to the promoting of natural knowledge. By laying these aside, and attending carefully to what nature hath either by chance or upon experiment offered to our observation, a greater progress hath been made in this part

of philosophy, since the beginning of the last century, than had been till that time from the days of Aristotle.

THIS advancement hath been greatly owing to those learned societies in Europe, who, by collecting papers relating to this branch of knowledge, have preserved many useful observations, which would otherwise have been lost.

As the art of Physic hath been much improved by this method of communicating observations, the College of physicians in London are desirous of furthering a design so worthy of their attention; and are ready
to

ADVERTISEMENT. vii

to receive any Medical Papers that shall be presented to them, in order to publish the most useful.

THOUGH the principal view of the College be to perfect the history of diseases, and ascertain the effects of medicines, yet papers which in any manner relate to medical subjects will be received.

MANY, who have given their observations to the world, have purposely selected such as were rare and extraordinary. Now, though these may be worth preserving, for almost all facts teach something, yet the preference should not be given to such; as the end of these collections

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is not merely to gratify the curiosity of the reader.

SINGLE cases, which occur every day in common distempers, and accounts of the ordinary effects of medicines, must be endless. Whatever important additions or exceptions to the general practice may be contained in those cases, would much better be drawn out by the author himself, and presented without giving along with them a tiresome account of common appearances, with which every one is supposed to be well acquainted.

It is to be wished that writers would not confine themselves to relate only their successful practice. A

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Physician of great experience might write a very useful paper, if he would have the courage to give an account of such methods of cure only as he had found to be ineffectual or hurtful.

THE College think it proper to declare, that they do not, as a body, mean to vouch for the truth of any relation, or to give authority to any opinion, contained in the papers here published.

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THE SECOND AND THIRD VOLUMES
OF
MEDICAL TRANSACTIONS.

M E D I C A L
T R A N S A C T I O N S.

- I. *Remarks on the Pump-Water of London, and on the Methods of procuring the purest Water. By WILLIAM HEBERDEN, M. D. Fellow of the College of Physicians, and of the Royal Society.*

Read at the COLLEGE, JUNE 22, 1767.

SEVERAL pump - waters of London, which I have examined, and probably most of them, contain powder of lime-stone, and the three mineral acids of vitriol, nitre, and sea-salt; besides which there is an oiliness, which discolours these waters, giving them a remarkable

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ably yellowish cast, when compared with pure distilled water.

THE spirit of vitriol changes as much of the lime-stone, as it can saturate, into selenite: the other two acid spirits dissolve a portion of the lime-stone, and make it intimately mix with the water, so as not to be separated from it by boiling heat; but the unneutralized lime-stone, as soon as the water is near boiling, begins to appear like a white powder, and gradually falls down, forming a crust in all the vessels in which pump-water is constantly boiled.

THE proportion of these ingredients is not only different in the different wells of this city, but even in water of the same well at different times. Without troubling the College with a detail of all my examinations, I shall only observe in general, that the greatest quantity of

of all of them together, which I have ever found, has been about twenty grains in a quart of water, and the least has been more than ten. The proportions likewise of these ingredients to one another vary considerably; in one trial, that part of the lime-stone, which is uncombined with any of the acids, appeared to be a little less than the part which was united with them; but, except in this one instance, I have constantly found the quantity of lime-stone uncombined with any acid, to be at least equal to all the other contents, and sometimes half as much more in the same well, and in different wells to be double or even treble of the selenite, and of the nitrous, and marine salts. Neither is the quantity of the acids constant: however, that of the vitriolic is usually the least, and that of the nitrous much the greatest, so as to be always at least double, and

sometimes nearly treble of the other two.

It might be expected, that all these disagreeable substances should remarkably taint this water; and yet the London pump-water is by many esteemed for its goodness and purity. But however it may be esteemed, it unquestionably differs from pure water in its taste, and color, and touch, as well as in many observable effects. Flesh boiled in it turns red, on account of the predominance of the nitrous acid; and it occasions, in a strong degree, all the other well-known changes in certain bodies peculiar to hard waters. Tea and coffee, made with it, are by most palates readily distinguished from these liquors when made with soft water: and the difference will as easily be perceived by the touch, if the hands be washed in pump and soft water.

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It must, I believe, wholly be resolved into the power of custom, that the inhabitants of London are so satisfied with this peculiar taste of their water, which is, as I have often been a witness, much complained of by those, who come hither from foreign countries, as very disagreeable to their palates, and sometimes as offensive to their stomachs. Custom makes the Greenlander fond of the taste of train-oil; and its power is, no doubt, as great in reconciling the drinkers of bad water to its ill taste. There is a town in North America, where the spring-water is brackish, the inhabitants of which, when they visit any of the other provinces, choose to put salt into their tea or punch, in order, as they say, to make it taste as it should do.

BUT though custom can reconcile our palates to the taste of lime-stone, spirit of vitriol, spirit of salt, and

aqua-fortis, it may still be questioned whether it can as easily make health consistent with the effects of these rough, and by no means inactive substances. They have been by many physicians suspected, when found in water, of occasioning pains in the stomach and bowels, glandular tumors, costiveness, where the simple lime-stone prevails, and diarrhoeas, where much of it is united with acids; and the uninterrupted drinking of such waters, for a long time, may probably be the cause of many other disorders, especially to the infirm, and to children. Hence a change of place may often be of as much use to weak persons from the change of water, as of air.

It has been a received opinion, that the use of waters much impregnated with lime-stone, or any stony matter, subjects the drinkers to the stone or gravel; but whatever other mischiefs

mischiefs these waters may have to answer for, they are innocent of this. For the calculous concretions in the kidneys and bladder are all of an animal origin, totally differing from all fossil stones in every thing, except the name: and the pretended experience of the effects of certain stony waters in breeding the stone, which is often appealed to, may upon the best authorities, be rejected as false*.

The putting of alum into bread raised not long ago a general alarm in London, and it was thought important enough to be the subject of a parliamentary enquiry. Now alum is frequently used as a medicine, upon a supposition undoubtedly of its mending the health, and has been given daily, for a long time together, in greater quantities than were ever sus-

* Acad. Royale des Scienc. 1700. Hist. pag. 58.
Perrault Vitruve, l. viii. c. 5.

pected to be eaten in bread; nor did I ever yet hear of any ill effects from it. There is no reason, which I know, for believing that the lime-stone and mineral acids are not as hurtful as alum, and there is no experience to prove them so innocent; but whoever drinks a quart of London pump-water in a day, may possibly take twice as much of these ingredients, and will always take more than the greatest quantity of alum which is said to have been ever mixed with a pound of bread; into which I have been assured that the bakers often used to put less, but never more than nine grains.

SOME obscure notion of the unwholesomeness of pump-water induces many persons to boil it, and let it stand to grow cold; by which it will indeed be made to part from most of its unneutralized lime-stone and selenite, but at the same time it

will

will become more strongly impregnated with the saline matter, and therefore it may be worse.

If a small quantity of salt of tartar were added to the water, it would readily precipitate both the loose lime-stone, and likewise that which is united to the acids: ten or fifteen grains would generally be enough for a pint; but the exact proportion would readily be found, by continuing to add it by little and little, till it ceased to occasion white clouds. This is an easy way not only of freeing the water from it's lime-stone, but also of changing the saline part into nitre and sal Sylvii, both which we know by long experience to be innocent.

BUT the best way of avoiding the bad effects of pump-water would be, not to make a constant use of it; and in a place so well supplied with river water as London, there is very little

little necessity to drink of the springs which, in so large a city, besides their natural contents, must collect many additional impurities from cellars, burying grounds, common sewers, and many other offensive places, with which they undoubtedly often communicate; so that it is indeed a wonder, that we find this water at all tolerable. One spring in this city never fails to yield a portion of volatile alkali in distillation, which probably is owing to some animal substances, with which it is tainted in its passage under ground.

THE Thames water has a share of all these impure ingredients: but as it is a much larger body of water, it is proportionably less infected by them. It is observable, that all the river water of England is soft, though most of the springs afford a hard water, which will not grow soft by being exposed to the air, or by time,

as

TRANSACTIONS. 11

as I have found by some which I had kept near twenty years. This makes it probable, that rivers are only the great channels by which the rain-water is immediately carried off; which so greatly exceeds, in quantity, that which soaks into the ground, and bursts out in springs, that the qualities of this last, contracted under ground, are lost and annihilated in the much greater portion of pure rain water, with which it is mixed in rivers.

THERE is an inconvenience attending the use of Thames and New River water, that they often are very muddy, or taste strongly of the weeds and leaves. The latter fault is not easily remedied; but they would soon be freed from their mudiness, if kept some time in an earthen jar. If the water, given to very young children, were all of this kind, it might perhaps prevent
some

some of their bowel-disorders, and so contribute a little to lessen that amazing mortality among the children, which are attempted to be brought up in London.

THE inhabitants of Egypt think the water of the Nile settles sooner, if the inside of the vessel, in which they let it stand, be rubbed with powdered almonds, which is therefore, as Prosper Alpinus * tells us, their constant practice. I have tried this, and could not find it of any use.

ALUM is very successfully used by the common people in England for the purifying of muddy water. Two or three grains of it, dissolved in a quart of thick river water, makes the dirt very soon collect into flocks, and slowly precipitate. Filtering would immediately make the water so prepared fit for use. The very

* De Med. Egypt. lib. i. c. 10.

small proportion of alum will hardly be supposed to make the water unfit for any common purposes.

RAIN or snow-water is much preferable to river, or to any other natural water; but there are almost insuperable difficulties in collecting large quantities for common use, without its being as much altered and defiled, by the manner of saving it, as it is when found in rivers.

THE method of procuring pure water, by carriage from any considerable distance, will always be attended with such an expence, that very few can or will make use of it even for the little which they want to drink.

THE purest of all waters might be obtained by distillation; and in countries where fuel is cheap, it would at no great expence supply those, who have the worst water,
with

with far better than is used in those places where it is supposed to be the best. This method would be particularly useful in some English settlements in foreign countries, where the waters are so bad, that, while our countrymen are making their fortunes, they are ruining their health: which might be effectually remedied by the means here proposed.

ALL the fresh water, with which nature supplies us, is indeed only distilled by the heat of the sun; but then the vessels, as I may say, used in this distillation, are not always so clean and proper, as might be wished. The vapours rise up through an atmosphere loaded with particles from all sorts of bodies, and the rain falls down through the same, and afterwards, running along the earth or sinking into it, dissolves all the saline matters

matters with which it happens to meet, and by their means many other substances; by which it is often rendered nauseous to the taste and smell, and apparently unfit for use. Its effects frequently prove it to be impure, though the senses be not able to inform us of it; so that experience soon taught mankind the importance of an attention to their health in this particular: and accordingly the oldest medical writer is very full in his directions for the choice of wholesome waters; and Vitruvius judged, that without them even a book of architecture would be imperfect.

It being, therefore, a matter of some importance to drink pure water; if any one be desirous of procuring it by that most efficacious and universally practicable method of distillation, it may be useful for him to attend to the following observations.

tions. I the rather mention these, as it is a very desirable thing to have pure distilled water kept in the apothecaries shops, for the purpose of making up those medicines, which cannot be made up with any other. The simple waters of the shops add much to the nauseous taste of many draughts, without at all improving their virtues. It is indeed generally true of all medicines, that they will be less unpalatable, in proportion as they are more tasteless.

THE first running of distilled water has a disagreeable musty taste, as if there were some volatile putrid particles, which went off as soon as the water was heated. I once suspected that this was owing to the worm having contracted some mustiness, which was washed off by the first running; but upon trial I found it not owing to this cause. This taste is not taken away, and does not seem

seem to be much lessened, either by time, or ventilation, or by having its air exhausted by the air-pump. On this account, if the still hold twenty gallons, it will be necessary to throw away the first gallon. All, which is distilled afterwards, though free from this mustiness, will yet have at first, in common with other distilled liquors, a disagreeable empyreumatic or burnt taste. This is easily distinguished by every palate in fresh distilled rum, brandy, simple and compounded waters. The purer the water is, the less will there be of this empyreuma; and hence perhaps it happens, that pump-water distilled has more, and retains it longer, than what is distilled from river-water. But the purest is not free, so that even distilled water, which has stood till it has lost its empyreuma, will have it again on being re-distilled.

THE empyreuma will go off entirely by keeping, and this is the easiest method of getting rid of it. In a month's time it will generally be gone; but if water, which is distilled on the same day, be received into different bottles, they will not all equally lose the empyreuma in equal times. This difference depends upon some circumstances in the management of the distillation, which farther experience will discover, but which I have not yet found out. It may be, that the fire being greater, and the water boiling at one time more violently than at another, may occasion this inequality of empyreuma in the several parcels of water of the same distillation: for water distilled in the gentle heat of *Balneum Mariæ* has remarkably less.

ANOTHER method of freeing distilled water from its burnt taste, is by ventilating it in the manner described by
Dr.

Dr. Hales, by which most of that taste will be carried off in a few minutes.

THE boiling of distilled water in an open vessel, will instantly take off the empyreuma. So that it may, as soon as it is distilled, be applied to any purposes, which require its being boiled in an open vessel.

DISTILLED water must be kept in perfectly clean glass or stone bottles, with glass stopples, or metal covers; and then, having in it no principle of corruption, it is incapable of being spoiled, and will keep just the same for ever: but the least particle of any animal or vegetable substance will spoil a great quantity, and therefore the still and bottles should be kept wholly for this use.

MOST pump-water is as incapable of changing, and of being spoiled by keeping, as distilled water: for though it be loaded with various foreign particles, yet it seldom has any,

or at most but a small proportion, of a vegetable or animal nature, and therefore it will always remain the same. This property of water is not so much attended to, as it ought to be, by sailors, who usually supply their ships with river-water taken up near great cities, and then keep it in wooden casks: the necessary consequence is, that it soon putrefies, and most probably contributes very much to the occasioning of those putrid distempers, with which sailors are so apt to be afflicted. Pump, or spring water, would be greatly preferable; and if they could keep this in glass or stone bottles, or earthen jars, they would find it, after being carried round the world, just the same as when they set out.

THE superior purity of distilled water, above all others, makes it easily distinguishable from them by a variety of tests. The tenderest of these
is

is sugar of lead, which instantly makes clouds in the purest of all other waters, but makes no change in that which has been distilled.

It is generally believed, that the swelled throat which is endemial in a slight degree in several parts of England, as well as so remarkably near the Alps, is owing (though not to snow-water,) yet to some bad quality of the waters of these respective places. I have reason to suspect, that the common swellings of the lymphatic glands sometimes owe their diseased state to the water which the patient drinks. In these cases, as well as in many chronic pains of the stomach and bowels, a course of distilled water might be as beneficial as the most celebrated mineral waters are in any other disorders, and might prove no inconsiderable addition to the *Materia Medica*.

As to the wholesomeness of distilled water for general use, there can hardly be any doubt of it, if we recollect that all the fresh water in the world has been distilled. But if any one think there may be a difference between natural and artificial distillation, I need only quote the example mentioned, I think, by Tournefort, of one Francis Secardi Hongo, who made distilled water his constant drink, without the addition of wine, or any strong liquor, to the last, and lived with remarkably good health to the age of 115 years.

II. *Of the Elephantiasis, by Dr.*
 THOMAS HEBERDEN, *of Madeira.*
Communicated by Dr. WILLIAM
 HEBERDEN.

Read at the COLLEGE, JUNE 22, 1767.

MOST Englishmen seem fond of persuading themselves, that they are born with some scorbutic taint; and, if they perceive any slight eruption, or scurf upon the skin, they consider it as the necessary produce of those latent seeds, from which none of their countrymen are supposed to be free.

It is not easy to account for the universal prevalence of a persuasion so destitute of any real foundation. The true scurvy is so rare a distemper, except among sailors, that there are many physicians of very considerable practice in England, who have never once seen it: and as to other disorders

ders of the skin, perhaps there are not many countries, in which there are fewer or slighter to be found, than in England. The inhabitants of the warmer climates seem to be much more liable to cutaneous diseases, and those of a far more inveterate and loathsome kind. The leprosy in particular, which is the worst of them, is almost unknown in this country; and in order to form an idea of it, we must necessarily apply to those who practise physic in foreign nations. For this purpose, I have desired my brother, who is a physician in the island of Madeira, to draw up an account of what he has observed relating to the history and cure of the leprosy; which he has communicated to me in the following paper.

Of

Of the Elephantiasis.

FREQUENTLY the first symptom is a sudden eruption of tubercles, or bumps of different sizes, of a red color, more or less intense (attended with great heat and itching) on the body, legs, arms, and face; sometimes in the face and neck alone, at other times occupying the limbs only; the patient is feverish; the fever ceasing, the tubercles remain indolent, and in some degree scirrhus, of a livid, or copper color, and sometimes of the natural color of the skin, or at least very little altered; and sometimes they after some months ulcerate, discharging a fetid ichorous humor in small quantity, but never laudable pus.

THE features of the face swell and enlarge greatly, the part above the eyebrows seems inflated, the hair of the

the eyebrows falls off, as does the hair of the beard : but I have never seen any one whose hair has not remained on his head. The alæ nasi are swelled and scabrous; the nostrils patulous, and sometimes affected with ulcers; which, corroding the cartilage and septum nasi, occasion the nose to fall.

THE lips are tumid; the voice hoarse; which symptom I have observed when no ulcers have appeared in the throat, although sometimes both the throat and gums are ulcerated.

The ears, particularly the lobes, are thickened, and occupied by tubercles.

IN the extremities, the nails grow scabrous and rugose, appearing something like a rough bark of a tree; and the distemper advancing corrodes the parts gradually with a dry sordid scab, or gangrenous ulcer; so that
5 the

the fingers and toes rot and separate, joint after joint.

IN some patients, the legs seem rather posts than legs, being no longer of the natural shape, but swelled to an enormous size, and indurated, not yielding to the pressure of the fingers; and the superficies is covered with very thin scales, of a dull whitish color, seemingly much finer, and not so white, as those observed in the *Lepa Græcorum*. The whole limb is overspread with tubercles, interspersed with deep fissures; sometimes the limb is covered with a thick moist scabby crust, and not seldom the tubercles ulcerate.

IN others, the legs are emaciated, and sometimes ulcerated; at other times affected with tubercles without ulceration.

THE muscular flesh, between the thumb and fore finger, is generally extenuated.

THE

THE whole skin, particularly that of the face, has a remarkably shining appearance, as if it was varnished, or finely polished.

THE sensation is very obtuse, or totally abolished; so that pinching, or puncturing the part, gives little or no uneasiness; and in some patients the motion of the fingers and toes is quite destroyed.

THE breath is very offensive; the pulse in general weak and slow.

THE disease often attacks the patient in a different manner from the above-described, beginning almost insensibly; a few indolent tubercles appearing on various parts of the body or limbs, generally on the legs or arms, sometimes on the face, neck, or breast, and sometimes in the lobes of the ears, increasing by very slow degrees; without any disorder, previous or concomitant, in respect of pain or uneasiness.

To

To distinguish the distemper from its manner of attacking the patient, give me leave to stile the first by fluxion, and the other by congestion.

THAT by fluxion is often attended with a crapula, or surfeit from gross foods; whereby perhaps the latent seeds of the disorder yet dormant in the mass of blood are excited; and I suppose it is from frequent observations of this kind (the last meal always having the blame laid on it) that, according to the common received opinion here, either fish (the tunny, mackrel, and shell fish, in particular) melons, cucumbers, young garden-beans, or mulberries, eaten at the same meal with butter, cheese, or any preparation with milk, are judged liable to produce the distemper, and are accordingly religiously avoided.

VIOLENT commotions of the mind, as anger, fear, and grief, have more
 4 than

than once been observed to have given rise to the disorder; and more frequently, in the female sex, a sudden suppression of an accustomed evacuation, by bathing the legs and feet in cold water, at an improper season.

THE disorder by fluxion is what is the ofteneft endeavoured to be remedied by timely application; that by congestion, not being so conspicuous, is generally either neglected or endeavoured to be concealed, until perhaps it is too late to be cured, at least, unless the patients would submit to a longer course of medicine, and stricter regimen of diet, than I have seen them inclined to do.

SEVERAL incipient disorders, by fluxion, I have known yield to an antiphlogistic method, as bleeding, sal diuret. in the saline draughts, and a solution of cremor tartari in water for their common drink (by this means

means endeavouring to precipitate part of the peccant matter, perhaps too gross to pass the pores, by the kidneys); and when once the fever is overcome, the cort. Peruv. cum cort. saffrafras, as mentioned in the following case, is the medicine I rely on; the only topical medicine I prescribe is the attenuating embrocation mentioned in the same account.

By the same method I have known some confirmed cases palliated.

BUT, excepting the patient of whose case I send you the relation, I have never seen or heard of a confirmed elephantiasis radically cured. This person has remained hitherto quite free from the distemper. Indeed I have never met with another, possessed with prudence and perseverance enough to prosecute the cure as he ought.

NOTWITHSTANDING the just abhorrence, which every one entertains
of

of this loathsome disease, it certainly is not so contagious as is commonly imagined: for I have never heard of any one who has contracted the distemper by contact of a leper; and, on the contrary, I not only am a daily witness of communication between lepers and other people, without the least ill consequence; but know several instances, where a leprous husband, married to a sound wife, has cohabited with her for a long series of years, and had several children by her, without her having contracted the least symptom of the disorder, although the children have inherited it: and, vice versa, between a leprous wife and sound husband.

I HAVE known several children, from the same parents, some of whom have the distemper, the others seemingly free from it; and know a family, whose father lived and died a leper; and of two sons and two daugh-

daughters who survived him, though at present each of them is advanced in years, the youngest daughter alone has shewed she inherits the disorder; and what I think worthy of remark is, that, although the eldest son, at present between 60 and 70 years of age, has never discovered in himself the least symptom of it; yet, his only daughter, now about 18 years old, has been afflicted therewith several years. Thus suppressed, but not subdued (we see) the fomes morbi may lie dormant a whole generation, and awake with full vigour in the succeeding one. Doth not the mass of blood, when once tainted, always preserve the seeds of the distemper blended therewith, and thereby acquire an aptitude to produce it, and only wait the concurrence of a proper agent to excite and put it in action?

It is the universal opinion here, that when once a person is infected, his posterity are never secure from it.

I HAVE known people live ten, fifteen, and more years, afflicted with this distemper, and at last die of other disorders; and do not remember to have seen more than one person, who could be said to have died of the leprosy: this was an old man, who, after having laboured many years under the disorder, and having been bed-ridden the last year or two of his life, at length died emaciated.

Extract of a Letter from Dr. THOMAS HEBERDEN, in Madeira, relating the Cure of a Leprosy.

I HAVE, in this island, experienced the use of the bark in four or five leprous patients with
7 success.

success. One had a confirmed elephantiasis ; the others were only incipient, having no other symptoms, than florid and livid tubercles in the face, and on the limbs.

THE confirmed elephantiasis was attended with livid and scirrhus tubercles, which had overspread the face and limbs ; the whole body was emaciated ; the eye-brows inflated ; the hair of the eye-brows fallen off intirely ; the bones of the nose depressed ; the alæ nasi tumefied, as likewise the lobes of the ears ; with a suffusion on both eyes, which had almost deprived the patient of his sight. There was a want of sensation in the extremities ; and a loss of motion in the fingers and toes.

FOR the space of more than seven years, I had in vain used every method I could think of to relieve my patient, either by forcing the peccant humor through the pores

of the skin, or by precipitating it through the kidneys, by the help of antimon. crud.; essent. antimonii; antimon. crud. part. ij. Æthiop. miner. part. j. ; Plummer's mercurial alterant assisted by sassafras tea; mercurius dulcis in small doses; mercurial frictions (taking care they should not affect the mouth); solution of sublimate, with decoct. sassafras; decoct. sarsaparillæ; neutral salts; tinctura cantharidum; whey simple and medicated; baths of warm water; baths medicated, &c. Each of these methods I pursued for several months successively; and though I often flattered myself, that I had gained advantage under each of them, yet a little time never failed to convince me of my mistake.

THE good effects obtained from the bark, in mortifications, wounds, and particularly in strumous disorders, determined me to make trial of it in this case; accordingly on the

2d of March, 1758, I prescribed the following electuary :

℞ Cort. Peruv. subtiliss. pulv. ℥iss.

Pulv. cortic. rad. saffrafras ℥fs.

Syr. simpl. q. s. F. electuarium :

Sumat q. n. m. majoris, bis in die.

I ordered him to rub his arms and legs, night and morning, with the following embrocation from Quincy :

℞ Spir. vin. tenuior. ℥ viii. Lixiv.

tartari ℥i. Spir. falis ammon.

℥ij. M.

and prescribed a perpetual blister inter scapulas.

By the latter end of May, the tubercles were considerably softened; by the 28th of June they were dissipated, and in their place the parts were covered with a scurfy efflorescence of a very florid red color, resembling the herpes, or common ringworm. July the 8th the eruptions had lost their florid color, turned brown, and peeled off, leaving the

cutis found and clean. The patient gradually recovered the sensation in his legs and arms, and the use of his toes and fingers; the hair has grown again on his eye-brows; and the only remainder of the distemper which I can perceive is, that the nose continues somewhat flatter from the depression of the bones. The suffusion is quite cured, and the patient is *εὐσάφης ἢ εὐχρῶς*.

His diet, during the whole cure, was flesh meat at dinner, sometimes fowl, but oftener (the patient being tired of fowls) fresh beef; his breakfast, toast and butter, with two dishes of coffee, mixed with an equal portion of milk; his supper, frequently the same as his breakfast, and sometimes a couple of new-laid eggs; he was allowed to eat lettuce, and now and then fresh cucumbers.

THE patient is thirty-one years old. He is so fond of the medicine,
from

from which he has received such benefit, that he has never neglected taking it every day constantly, from the time he first began it.

I MUST observe, that mercurials did no way exasperate the disorder (as is commonly believed); at least I could never perceive that effect from them; although I was particularly careful in endeavouring to find out the truth of the common opinion.

A Note to the foregoing Case, by Dr.
WILLIAM HEBERDEN.

VIPERS being considered as a specific against leprosies and many other cutaneous diseases, it may not be improper to subjoin, to the foregoing case, some account of their introduction into the materia medica.

THE serpent was made the symbol of life long before any of the kind were used as medicines. *Æsculapius*

is always represented with a serpent, because it casts its skin and grows young again *. There is reason to suspect, that this supposed power in the serpent, of restoring itself to fresh health and youth, has had no small share in giving it the reputation of a notable restorative; for there is no end of the medicines, which have been confided in upon this frivolous conceit.

THERE is some uncertainty about the time and occasion of the viper's becoming a part of the materia medica. An animal so dreaded was not likely to be soon ventured upon for internal use. Antonius (supposed to be the physician to the Emperor Augustus) is said to have cured bad ulcers by ordering the patient to live upon vipers †. This practice took its rise from an accident, according to Galen,

* Macrob. lib. i. c. 20.

† Plin. H. N. lib. xxx. c. 12.

who

who informs us *, that a leper drank wine, into which a viper, allured by the wine, had chanced to fall, and was cured, though the viper had not been in the wine long enough to be dissolved. But, if Antonius Musa used them, Galen must be mistaken in saying, that this was the occasion of their first being known as a remedy, and that this happened in his own time. Besides, Aretæus, who is probably older than Galen, mentions (*de Elephantiasi*) this story with some little variation ; and says of it, that it was a tale not very certain, though not altogether incredible. Celsus likewise seems to allude to the same story †.

If we were to form a judgment from the effect which vipers are now found to have in leprous cases, we must think, that this leper had extraordinary luck in being cured by

* *De Simpl. Med. lib. xi.*

† *L. v. c. 28. de Struma.*

the infusion of a single viper, even though it had been dissolved. Redi (de Viperis) assures us from experience, that this pretended fact is highly improbable ; because he found that a viper would not be at all tempted to taste of wine, as the story alledges ; and that it could easily have got out again, if it had chanced to have fallen into such a small vessel.

SOME have esteemed the viper as a medicine, from their belief in the vulgar opinion, that every poison is accompanied with an antidote ; whence it would readily be imagined, that, if the poisonous part of this animal were taken away, there would somewhere in the remaining parts be a powerful antidote, not only to the subtle poison of the viper itself, but likewise to the taint of many other distempers.

THOSE, who have attempted to reason upon its virtues, tell us, that a great quantity of volatile salt may be
procured

procured from this animal, and that to this its activity as a medicine is owing. But this reasoning will have very little weight with those chemists, who are persuaded, that the volatile salt of the viper differs not from that of any other animal; and consequently, that, if the virtues of the viper all depend upon this, they may be had in a much easier manner than by the eating of vipers: not to mention the inconsistency of these reasoners upon the actions of medicines with others, who teach us, that the scurvy and other cutaneous diseases are owing to a high animal diet, such as living upon carnivorous animals, the flesh of which is supposed to be more highly animalized and fuller of volatile salt.

UPON the whole, what has been advanced by the old physicians is so full of fable, or so uncertain and inconsistent, that no deference to their authority

authority in the present article ought to outweigh a very small degree of any modern's experience. And if we consider the present state of the practice of physick, we shall find that time has rather weakened than established the reputation of medicines prepared from vipers; that some experienced physicians have in their writings declared them to be of little use; and that many in their practice, after frequent disappointments, have wholly laid them aside.

III. *Observations upon the Ascarides.*
Communicated by Dr. WILLIAM
 HEBERDEN.

Read at the COLLEGE, JUNE 22, 1767.

ONE use of such collections of medical papers, as the College now proposes to publish, is to preserve any materials as they occur, which are true and original, and useful towards better ascertaining the nature of a disease, or the power of a remedy, without waiting till we have time to draw up a perfect history. It is in this light, that I would have the following particulars considered, relating to the history and cure of worms.

KNOWING an experienced and intelligent physician, who had from his infancy been troubled with ascarides, I desired to be informed by him, what were the inconveniencies which they had occasioned, and what was
 6 the

the success of the remedies which he had used. There cannot be a more favourable opportunity of learning the nature and cure of a distemper, than when we meet with a case where the physician has been always present with the patient, and where he must be supposed to have paid due attention to every circumstance.

THE account, which I received, was, that, according to his experience, the peculiar symptoms of this species of worms, are a great uneasiness in the rectum, and an almost intolerable itching of the anus. These sensations most usually come on in an evening, and prevent sleep for several hours. They are attended with a heat, which is sometimes so considerable, as to produce a swelling in the rectum both internally and externally ; and, if these symptoms be not soon relieved, a tenesmus is brought on, with a mucous dejection.

Sometimes

Sometimes there is a griping pain in the lower part of the abdomen, a little above the os pubis. If this pain be very severe, there follows a bloody mucus, in which there are often found ascarides alive. They were sometimes suspected of occasioning disturbed sleep, and some degree of head-ach.

PURGING and irritating clysters were injected, with very little success.

ONE drachm and a half of tobacco was infused in six ounces of boiling water; and the strained liquor, being given as a clyster, occasioned a violent pain in the lower part of the abdomen, with faintness and a cold sweat: this injection, though retained only one minute, acted as a smart purge, but did little or no good.

LIME-

M E D I C A L

LIME-WATER was also used as a clyster, which brought on a costiveness, but had no good effect.

SIX grains of salt of steel were dissolved in six ounces of water, and injected. This clyster, in a few minutes, occasioned an aching in the rectum, and griped a little without purging, and excited a tenesmus. Some few ascarides were brought off with it, but all of them were alive. The uneasy sensation created by this clyster did not abate, till some warm milk was thrown up.

WHEREVER the tenesmus or mucous stools were thought worth the taking notice of, warm milk and oil generally gave immediate relief. If purging was necessary, the lenient purges (such as manna with oil) were in this particular case made use of; rhubarb was found too stimulating.

BUT in general the most useful purge, and which therefore was most usually

usually taken, was cinnabar and rhubarb, each $\mathfrak{z}\text{ss}$: this powder seldom failed to bring away a mucus as transparent as the white of an egg, and in this many ascarides were moving about. The cinnabar frequently adhered to this mucus, which did not come off in such large quantities, when a purge was taken without the cinnabar.

CALOMEL did no more than any other purge, which operates briskly, would have done; that is, it brought away ascarides with a great deal of mucus.

OIL given as a clyster has sometimes brought off these animalcules: the oil swam on the surface of the mucus, and the ascarides were alive moving in the mucus, which probably hindered the oil from coming in contact with them and killing them. The same mucus may reasonably be supposed to preserve these worms

unhurt, though surrounded with many other liquors, the immediate touch of which would be fatal.

IF the ascarides be taken out of their mucus, and exposed to the open air, they become motionless, and seem to die in a very few minutes.

THE general health of this patient did not seem to have at all suffered from the long continuance of his disorder, nor the immediate inconveniences of the disorder itself to have increased. It is perhaps universally true, that this kind of worms, though as difficult to be cured as any, yet is the least dangerous of all. They have been known to accompany a person through the whole of a long life, without any reason to suspect that they had hastened its end.

As in this example there was no remarkable sickness, indigestion, pains of the stomach, giddiness, nor itching of the nose, possibly these symptoms,

where they have happened to be joined with the ascarides, did not properly belong to them, but arose from other causes. There is indeed no one sign of these worms, but what in some patients will be wanting.

FROM this case it farther appears, that mucus or slime is the proper nest of the ascarides, in which they live, and perhaps the food by which they are nourished. It is hard to satisfy ourselves by what instinct they find it out in the human body, and by what means they get at it; but it is observable in many other parts of nature, as well as here, that where there is a fit soil for the hatching and growth of animals and vegetables, nature has taken sufficient care that their seeds should find the way thither. Worms are said to have been found in the intestines of infants, who were born dead.

PURGES, by lessening this slime, never fail to relieve the patients ; and it is not unlikely that the worms, which are not forced away by this quickened motion of the intestines, may, for want of a proper quantity of it, languish and at last die. Experience has furnished me with no objections against supposing, that the kind of purge is of little moment in the cure of all other worms, as well as of the ascarides, the worms being always defended from the immediate action of medicines ; and that therefore those purges are the best, which act briskly, and of which a frequent repetition can be most easily borne. Purging waters are of this sort, and jalap, especially for children, two or more grains of which mixed with sugar are most easily taken, and may be repeated daily. I leave it to the judgement of others, whether the effect of the method of cure made use of

in the following history, communicated to me by Mr. Leigh Thomas, surgeon at Hawarden, in Flintshire, may be accounted for upon this supposition, or whether it proves that there is, in common salt, a specific virtue of destroying worms. Besides this virtue of salt, we learn, from the following case, that large doses of salt must be added to the number of simples which are known to produce a strangury; and that therefore saline liquors should be avoided, where there is a disposition that way; and farther, that the ascarides are found in the stomach, as well as in the rectum; though this last be their principal seat.

IV. The remarkable good Effects of large Doses of common Salt, in an extraordinary Case of Worms.

DANIEL Neal, of the parish of Doddlestone, in Cheshire, in or about February 1757, was attacked

with uncommon pains in his stomach, attended with nausea, vomiting, constipation of the bowels, and an almost total loss of sleep and appetite. Under these circumstances he soon became greatly emaciated, and could neither stand nor walk uprightly; his belly grew small and hard, and so closely contracted, that the sternum covered the navel in such a manner, it could with difficulty be discovered or felt with the finger; his urine was always milky, and soon deposited a thick white sediment; his excrements were very hard and lumpy, resembling those of sheep, only of a brown color, nor had he ever a stool of that kind without some medicine or other to procure it. In this terrible condition, he sought every where for relief, tried numberless remedies, but all to no purpose. About Midsummer 1761, he was admitted into a neighbouring infirmary, which was well attended

attended by gentlemen of great skill and knowledge in their profession, where the utmost care was taken of him, and every method practised that was likely to relieve him; but growing no better, and wearied with taking medicines, he was, at the end of seven weeks, discharged at his own request, and returned home, wishing death would put a speedy period to those torments he had so long endured, and for which he believed there was no other remedy. In this melancholy situation he lingered on till the Christmas following, when he was advised by a neighbour to drink salt and water, as he once knew a person cured by it, who had been many years afflicted with the same kind of pains in the belly and stomach. Encouraged by this account, he became impatient to try the experiment, as his disorder was now become almost insupportable. Accordingly, he had,

the very next morning, two pounds of common salt dissolved in two quarts of spring water, all which he drank in less time than an hour. Soon afterwards, he found himself greatly oppressed at his stomach, grew extremely sick, and vomited violently; on the fourth straining, he brought up about half a pint of small worms, part ascarides, and the rest resembling those worms which are called the botts, and frequently met with in the stomach of horses, only much smaller, and about the size of a grain of wheat: after this, the salt soon procured itself a passage through the intestines, which, for the fourteen preceding days, had been quite locked up, and never done their office. He had now five or six very copious fetid stools tinged with blood, and discharged in them near an equal quantity of the same kind of worms which he had vomited. Being greatly

greatly fatigued with the violence of the operations, he got to bed, and soon fell into a quiet calm sleep that lasted two hours, during which he sweated most profusely, and awoke much refreshed : instead of his usual pains, he now only complained of a rawness and foreness in his gullet, stomach, and bowels, with an almost unquenchable thirst; to allay which, he drank large quantities of cold water, whey, butter-milk, or whatever he could get. The urine he now passed was small in quantity, and rendered with great difficulty, being highly saturated with the salt, from whence arose a most troublesome dysuria and strangury. However these symptoms gradually abated by a free use of the cold liquors before mentioned, and on the third morning he was so well recovered, that he took two pounds more of salt, dissolved in the like quantity of water

water as before ; the effects of which were nearly similar to the former, only, that most of the worms were now burst, and came away with a considerable quantity of slime and mucus. The drought, strangury, &c. returned with their former violence, but soon yielded very easily to the old treatment. He sweated very copiously for three days, slept easily, and by that time could extend his body freely : on the fifth day he left his bed, and, though very weak, could walk uprightly ; his strength and appetite soon returned, and he is now perfectly robust and well. For two or three mornings before the full and change of the moon, he continues to take half a pound of salt dissolved in a pint of water, by way of precaution, though he feels no return of his old disorder.

NOTE.

NOTE.

As common salt requires more than three times its weight of water to dissolve it; there must have been a greater proportion of water than is here mentioned, unless the salt was very damp, or mixed with sal catharticus.

V. *Of the Night-Blindness, or Nyctalopia: By Dr. WILLIAM HEBERDEN.*

Read at the COLLEGE, JULY 6, 1767.

THE registering of single cases would be tedious and useless, where they describe distempers and effects of medicines, which are met with every day. But of such as are very extraordinary and uncommon, which give no one person an opportunity of collecting a general knowledge of their nature from a sufficient number of patients, there seems no other way of procuring a history, than by preserving for a considerable time every particular case which occurs.

THE night-blindness, or nyctalopia, as it is called by some physicians, is one of those rare disorders, which have not often been described; and therefore

therefore I have judged it not improper to lay the following example of it before the College.

A MAN about thirty years old had in the spring a tertian fever, for which he took too small a quantity of bark, so that the returns of it were weakened without being entirely removed. He therefore went into the cold-bath, and after bathing twice he felt no more of his fever. Three days after his last fit, being then employed on board of a ship in the river, he observed at sunsetting, that all objects began to look blue, which blueness gradually thickened into a cloud; and not long after he became so blind, as hardly to perceive the light of a candle. The next morning, about sunrising, his sight was restored as perfectly as ever. When the next night came on, he lost his sight again in the same manner; and this continued for twelve days and nights.

nights. He then came ashore: where the disorder of his eyes gradually abated, and in three days was entirely gone. A month after, he went on board of another ship, and, after three days stay in it, the night-blindness returned as before, and lasted all the time of his remaining in the ship, which was nine nights. He then left the ship; and his blindness did not return while he was upon land. Some little time afterwards, he went into another ship, in which he continued ten days, during which time the blindness returned only two nights, and never afterwards.

IN the August following, he complained of loss of appetite, weakness, shortness of breath, and a cough: he fell away very fast, had frequent shiverings, pains in his loins, dysury, and vomitings; all which complaints increased upon him till the middle of November, when he died.

HE

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He had formerly been employed in lead-works ; and had twice lost the use of his hands, as is usual among the workers in this metal.

VI. Obser-

VI. *Observations on Cancers: By*
MARK AKENSIDE, M. D. *Fellow*
of the College of Physicians, and
of the Royal Society, and Physician
to Her Majesty.

Read at the COLLEGE, JUNE 6, 1767.

IN the summer of the year 1761, a man about threescore years of age came to St. Thomas's hospital, from a village at some distance; not with any intention of being admitted as a patient, but in order to obtain present assistance for an uncommon disorder. He was in general healthy, and apparently of a good habit of body; but had been accustomed, during the greater part of his life, to a constant succession of wens, that shot out in several places; on his head, trunk, arms, and legs: which indisposition he inherited from
his

his father. As often as these wens became inconvenient from their size, his method was, to cut them off with a razor; at which times, he constantly found that they grew upon the part by five or six suckers, as he called them. He had not much trouble in extirpating them, except when the razor passed through those suckers; at each of which, he felt, on the instant, a most acute pain; but, in this manner, he fairly got quit of them. When I saw him, he had three such wens: one on the forehead near the edge of the hair, about the size of a horse-bean; another on the short ribs of the right side, as big as a hen's egg; and the third on the greater extremity of the os ulna of the right arm, somewhat less than a common nutmeg. This last was the occasion of his applying to me: for, as it advanced in size, a numbness was produced in the fore arm and

VOL. I. F hand;

hand; so that the use of them had of late been much impaired, as with a palsy; while, from the proximity of the wens to the joint of the elbow, he was afraid of employing his razor, as he had been used to do in other parts of his body.

UPON examination, I found these wens to be hard, indolent tumors, sitting loose and moveable upon the cellular membrane. As that near the elbow differed not from the rest, and was in no degree engaged in the joint, I directed it to be cut off, and a warm saponaceous liniment to be frequently rubbed on the arm and hand, in order more speedily to restore them to their natural feeling and activity. The man himself I never saw nor heard of again.

THIS case may be considered as illustrating the origin of the most common species of cancer. Each of these wens had arisen in some one of the

the subcutaneous glands. The fluid separated in the gland, being too viscid to pass through the excretory duct, had stagnated within the gland. As it increased by the continual afflux of blood to the secretory vessel, it had distended the whole glandular structure, and had made room for itself by protruding the skin. The several vessels of the gland had, by their distension, acquired a præternatural sensibility; which was here so remarkable in the pain which the man felt in cutting them through with his razor, and which generally occasions the worst of what is endured in the extirpation of a confirmed and ulcerated cancer. If then, to the tumor in this condition, there had been superadded any cause of local inflammation and pain, the case would speedily have advanced nearer to a cancer: the wen would have ceased to be indolent; its color

would have changed to an obscure red, livid, or purple; a sense of itching would have been raised; and then by degrees would have come on the principal diagnostic sign of a cancer not yet ulcerated; I mean that pricking, shooting, or lancinating pain, which seems to proceed from the pulse of the small arteries. For these, being now enlarged by the disease, gain not only a sensibility, but a vibration and force which they had not naturally; agitating the obstructed matter, and compressing or irritating the adjacent nerves, as often as the arteries are dilated. When in this manner the inflammation goes on, it ends in an unkindly suppuration, the skin is broken, and the cancer completed. Instances of which morbid process occur in practical writers through every stage of it. In the mean time the case before us may serve to shew how much the production

production of cancers belongs to the habit of the whole body. For these little scirrhus tumors would in all probability have grown cancerous, but for two circumstances; first, for the protrusion of the skin, which released them from the pressure and heat of the neighbouring parts; and then, for their early extirpation. But they had, during many years, been generated, one after another, in almost every part of the surface of the body; and were, besides, the apparent consequence of an hereditary vice in the habit: so that there can be no wonder if, upon the extirpation of a complete cancer, the disease should be apt to break out again in some other part.

As this is perhaps the most dreadful ailment to which the human body is liable, and as the evil itself is much aggravated by the hopelessness which attends it; adventurers have of course been ambitious to undertake it, and

many secret medicines have been proposed for its cure. Of these each hath had its day : furnishing matter for discourse and speculation at first ; but not long supporting itself under an adequate experience. In our times, the narcotic vegetables have been chiefly in fashion : among which, the solanum some years ago, and lately the cicuta, made much noise. The former seems now to be generally forgotten : concerning the latter, no absolute decision hath yet taken place ; though it be considerably fallen from its first reputation. But, before I state that opinion which my own experience has suggested to me concerning it, I shall mention an observation or two, which occurred to me before I knew that the cicuta had ever been employed as a remedy for cancers.

WHEN some years ago the mercurius corrosivus sublimatus was, in treating the venereal disease, found so much

much more efficacious than the other internal mercurial medicines; it was natural to infer that it would, perhaps in the same degree, prove likewise a more powerful alterative in scrophulous cases and in bad sores. Being confirmed by frequent experience in this opinion, (which probably had occurred to many practitioners, and which, I find, had been verified*, both at Edinburgh and in London, so early as the year 1757) I began to make trials of the sublimate in cancers a short time before I first heard the cicuta talked off in that disease. The trials were of course not many; and the success of them will best appear by a recital of facts.

In the beginning of the year 1760, a woman about fifty years of age came under my care, at St. Thomas's hospital, for a scirrhus swelling on

* See Medical Essays, &c. by a society of physicians in London, vol. II. p. 220, and 330.

the right side of her neck. It was partly covered by the lobe of the ear, and lay principally in the hollow which is occasioned by the articulation of the lower jaw with the os temporis. From thence it extended to the inside of the jaw, so as to impede her swallowing, and to cause great pain in her throat and over all her mouth, accompanied with a constant ill taste and smell. The external surface of the tumor was likewise very painful; and from it the pain was propagated upward over her temples, stinging and lancinating, as in a cancer. I gave her, twice a day, a quarter of a grain of corrosive sublimate in a spoonful of proof spirit of wine; ordering the primæ viæ to be kept open by taking every day three half-pints of Lambeth-water, better known by the name of the Dog and Duck. She found benefit daily under this regimen. The pains in her neck and up the side of her face

face gradually vanished; the scirrhus tumor grew less, her deglutition easy, and her mouth free from soreness: so that, in less than five weeks, she desired to be dismissed from the hospital. On laying aside her medicines, the disorder returned; and, a fever seizing her about the same time, her pains ere long grew almost as violent as ever; upon which she was readmitted. As soon as her fever was removed, I put her into her former method, and with the same success; for, in less than a month, her complaints were so far gone, that she could not be prevailed upon any longer to neglect her business, as she said, and went out of the hospital. I heard no more of her: and though I thought her not yet secured against a second relapse, yet in all probability she continued well: otherwise I doubt not, she would once more have applied to me.

SOON

Soon after this, I was consulted for another woman, rather older, whose tongue, after it had been for some time swelled and scirrhus, was now ulcerated, like a proper cancer, with most severe pain in the sore, and with the stinging and lancinating pains through the neighbouring parts. The corrosive sublimate being given her, at the rate of a quarter of a grain twice a day, and care being taken to keep her diet cooling and laxative, the disease was almost intirely removed within a few weeks, the ulcer healed, the pains forgotten, and little or nothing of the original swelling and hardness remaining. But, in other cases where the cancer had been ulcerated during a longer time, and had made a larger and deeper sore, this medicine had little effect. However, it seemed no inconsiderable step, in one of these instances, merely by an alterative medicine, to have resolved

solved almost entirely a painful scirrhous, and in the other, to have healed an ulcerated cancer.

ABOUT this time Dr. Storck's book was published at Vienna, and soon became the subject of general attention and conversation in England. Great things were now expected from the cicuta, notwithstanding our late disappointment in the solanum. The city of Vienna had for some time been in considerable repute, as a school of physic; and the late valuable acquisition of the corrosive sublimate, for which the materia medica had been indebted to the chief of that school, made every one at this time listen with some eagerness to the promise of a new medicine from thence; especially in so terrible and untractable a disease as the cancer. Nor was ever any such promise made in a larger or more liberal manner than by this author. However, as his facts were
so

so circumstantially told, and the Baron Van Swieten appealed to as a voucher for many of them, it seemed but reasonable to expect that, though the cicuta should not deserve the character of a specific for cancers, it would yet at least prove more generally successful than otherwise. Accordingly, with this persuasion, I tried it on a great variety of patients; in ulcerated cancers of different dates; in scirrhus tumours not yet ulcerated, but accompanied with lancinating pains; and in each of these, as they occurred, in different parts of the body, and in both sexes. I also tried it in stumous swellings and bad old sores, both internally and externally: and, upon the whole, am able to confirm but a small part of what Mr. Storck had prepared me to expect.

I BEGAN with two grains of the extract twice a day; and, as I grew better acquainted with the medicine, increased

increased in quantity, I have sometimes, even in beginning with it, given half a scruple thrice a day; but have not often exceeded a drachm in four and twenty hours: being fully convinced that every thing in its power may be performed without going beyond that dose. As to its sensible effects, it was generally a harmless and practicable medicine. Sometimes it occasioned a sickness at the stomach: but this was easily prevented by giving some warm aromatic along with it. Sometimes also it brought on a giddiness of the head, with cold sweats: but these likewise soon yielded to the same kind of medicines. At first it sometimes purged, even when taken in so small a quantity as three grains twice a day, so as to produce seven or eight motions in four and twenty hours. But this effect went off as the patients grew more familiar with the medicine;

medicine; and then it seemed rather to have the contrary tendency.

WITH regard to its effects on the disorders in question, it promised much at first. The lancinating pains of scirrhus tumors were almost instantly relieved: the ichor of ulcerated cancers soon, often within eight and forty hours, began to digest and to look like a laudable matter. The decoction of the cicuta, applied externally as a fomentation, or made up with oatmeal into a cataplasm, in bad scrophulous swellings soon brought on a favourable alteration, and for some days continued it: so that I have seen a large and hard glandular tumor, on the neck, reduced by this means, in less than a fortnight, to half its size, rendered quite definite, and made to sit loose upon the part. But, of these effects, none were permanent: few of them continued above a fortnight; many not half that time. When the medicine was

this found to grow ineffectual, the dose of it internally was of course increased. Upon this, things grew better again; and, for some days, the cure seemed to go forward: but not more steadily than before. And such was almost uniformly the event: the cicuta proving like other narcotic or anodyne medicines; doing wonders at first; losing its force, as it becomes familiar; acquiring it again, when taken in a greater quantity; till the dose is too large to be increased, and the patient finds himself as he was at setting out, or rather in a worse condition. It must be owned, at the same time, that the cicuta in cancers, especially of the uterus, looks like a sort of specific anodyne, and relieves the topical complaint in a degree much beyond what opium or the other narcotics can pretend to: which will remarkably appear in the following case.

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A WOMAN about fifty years old, who had borne several children, came under my care for a cancer of the womb, which had gradually advanced upon her from the time of her ceasing to menstruate. Round the lower part of the abdomen, probably from the constant increase of a scirrhous swelling in the womb, she felt almost incessantly pains of the stretching, tearing kind, intermixed with the shooting, stinging, and properly cancerous ones: so that she had now for some weeks been seldom able to rise from her bed. She had also daily a copious discharge of a greenish and acrid ichor from the vagina. For these complaints, I prescribed to her, twice a day, half a scruple of the extract of cicuta. Her pains, both the tearing and the lancinating, were soon laid asleep; the ichorous drain was almost quite stopped, and the uneasy tension of the abdomen taken off:

off: so that she could now rise with perfect freedom, and walk into the air as she had used to do. In the meantime the medicine rather purged her, not inconveniently: but it occasioned neither sickness, nor giddiness, nor cold sweats. In this manner she went on for about ten days; at the end of which, her former complaints gradually returned, and ere long she grew nearly as ill as ever. I then increased the dose of her medicine to fifteen grains twice a day; which restored her to her former ease, and continued her in it for about ten days more: after which, at a time when I could not see her, the pains returned more suddenly than they had before done, and became more violent than they had yet been. She was in torture for near forty-eight hours, and then grew cold and comatose till she died; having in the meantime regularly taken the fifteen grains

of her medicine twice a day. Here we see the anodyne effects of the cicuta may not improperly be counted specific. For without being topically applied, and without materially affecting either the body in general or any particular function, it not only allayed the pains, but almost totally checked the ichorous discharge, and took off the tension of the adjacent parts. But though such a relief to a person who has been long under the torture of a cancer, will naturally seem the effect of a most divine medicine; yet, after all that comfort and those flattering promises, to endure again the same misery, heightened by so cruel a disappointment, may perhaps render it doubtful whether it would not have been better for the patient to have died without the experience of so fallacious a remedy.

NEVERTHELESS, may not this anodyne effect, temporary as it is, conduce
impor-

importantly to the radical cure of the disease? Such extreme pain is not only the effect of a dreadful cause, but, is in many respects, a mischievous cause itself; increasing the tension of the fibres, spreading the inflammation, and heightening the malignity of the diseased fluids. For which reasons, an anodyne so powerful as the cicuta will at least procure a fairer opportunity for alterative and radical medicines, if such can be found; medicines that may resolve the scirrhus obstructions, and correct the acriminous and putrid fluids: without which the good effects of the cicuta are, as we have seen, little to be depended on. What the corrosive sublimate will contribute to these ends has been already mentioned. Another alterative medicine, of the first utility, is the cortex Peruvianus. From the known efficacy of this, in mortifications, it was gradually introduced

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duced into the cure of ill-conditioned sores; being, for this purpose, often joined with mercurial alteratives. It was therefore an easy transition to prescribe it for cancers, in conjunction with the cicuta, or the sublimate, or both. I shall relate a few cases illustrating the efficacy of these medicines, when they are made to assist each other in the treatment of cancers.

A WOMAN about thirty years old, of an healthy but rather delicate habit, soon after parturition, was seized with a pain in her side, which continued near a month with little intermission, and then left her. Soon after this, she felt a beginning hardness and swelling in utero. It increased slowly, but constantly; and was at length accompanied with a pricking, shooting pain, like a beginning cancer. The disorder had been sensible to her about a month when I
first

first saw her. Her pains were then violent, so as frequently to make her weep and shriek. The scirrhusity was to be felt externally above the os pubis. I ordered, twice a day, five grains of the extract of cicuta, and thrice a day three ounces of the decoction of the bark, made in the common proportion, of an ounce of the bark to a pint of the decoction. Her five grains of the extract I gradually increased to half a scruple. With this regimen her pain was soon relieved; the swelling and hardness relented; and, in less than six weeks, all the three were perfectly removed. But soon afterward she perceived a different sort of swelling in the lower part of the abdomen, which, to all appearance, was a beginning hydrops ovarii. On this, she was directed, to omit her former medicines; and her new complaint, in a short time, yielded to a bitter infusion with lixivial salt,

and to other opening medicines. A considerable time afterward, I understood, that she was perfectly well, and had had no return of her uterine pains or scirrhusity.

THE second instance which I shall give, is of a middle-aged woman, to whom, in the beginning of the year 1763, the cicuta, the sublimate, and the bark, were administered together. This person's tongue had, during a considerable time, been swelled and scirrhous, for above half its length, on the left side. It was now ulcerated, along the edge, toward the lower jaw, near an inch in length. The sore looked jagged, and was covered with a whitish mucus. The patient had great pain, not only in the sore, but through all that side of her face, lancinating and shooting through her jaws, and up her temples. She was otherwise well, and of a good habit; nor did she recollect any particular
cause

cause or accident which had contributed to her disorder. That she might have every probable chance for getting well, I gave her, of the extract of cicuta, five grains twice a day; of the corrosive sublimate, a quarter of a grain twice a day; and of the decoction of the bark, three ounces thrice a day. Within eight and forty hours, her pains began to grow easier, and had quite left her in less than a fortnight. The ulcer gradually healed. After she had proceeded, for near three weeks, in this method, the sublimate made her mouth sore, and brought on a salivation. But as she was positive that this new soreness was totally unlike any thing she had suffered from her former complaint, and as she now felt nothing of the lancinating pains, I advised her to proceed with the sublimate; thinking that a moderate salivation, thus circumstanced,

might produce a more lasting and radical cure. She now discontinued the decoction of the bark, and had, instead of it, a decoction of the woods, which she used as her common drink. In this manner she went on for near three weeks, spitting from a pint to a quart every day; without the least return of her original ailment. She then happened to get a catarrhal fever, with a pain in her side. On this she left off the cicuta, and the sublimate, and, by proper medicines, grew well. Nor has she since had any return of the cancerous appearances in her tongue.

I FEAR left this detail of cases grow tiresome. But medical practice, with respect to the disease before us, is so very imperfect, has so few instruments to work with, and these so little ascertained in their effects, that it may be doubted whether, upon this subject, the publishing

ing of any thing, except cases, can be of much utility at present. I will venture then to transcribe one more, and conclude.

ON the third of January, 1767, a sailor, between forty and fifty years of age, was admitted into St. Thomas's hospital for a cancered lip. Between a fortnight and three weeks before his admission, being at work on the top-mast, he slipped, and struck his under lip violently against some part of the rigging. It swelled immediately, and grew scirrhus. Four or five days afterward, he felt hot and lancinating pains; which every day extended themselves farther, darting behind his ears, down his throat, and over his temples. About a week after the accident, the lip ulcerated; and, when he came into the hospital, was drawn outward and downward. The ulceration reached from one corner of the mouth to the
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the other, but with a considerably greater loss of substance, and depth of the fore, in the middle of the lip. The fore looked very foul, jagged, of a greenish brown color, and was manifestly a true ulcerated cancer.

At his admission into the hospital, I ordered him five grains of the extract of cicuta twice a day; a quarter of a grain of corrosive sublimate twice a day; and three ounces of decoction of the bark thrice a day. His pains were sensibly relieved within four and twenty hours, and in a few days were quite gone. At the same time, the fore mended continually, grew less in size, had a better color, was not so jagged. When he had taken the cicuta during ten days, his pains having been for some time removed, I ordered him to lay it aside, and to proceed with only the sublimate and decoction; being persuaded that the cicuta, by removing the
pains,

pains, had performed all that was to be expected from it. Accordingly, the cure of the fore advanced as well without it as with it: till, on the twenty-seventh day of January, between three weeks and a month after his admission, the whole lip was healed, and he would have gone out of the hospital: but I chose to detain him a fortnight longer, that he might be more secure from any relapse. During the last week of his stay, he laid aside the sublimite, going on with the decoction only. The lip was now perfectly sound every where; but had in the middle a dent, or hollow-place, about half an inch in depth, where the cancer had begun, and had penetrated farthest. While he was under my care, he observed no particular abstinence, but used the common hospital diet. Nothing, in the mean time, was applied to the fore, except a poultice of bread
and

and milk, for the first three or four days; and, during a fortnight or three weeks afterward, a clean linen cloth, which was tied behind his ears, and loosely covered his under lip.

It is impossible to review these histories, without observing, that all of them, which terminate favourably, relate to a recent state of the disease, where the ulceration was either not yet begun, or had not extended far, nor penetrated deeply. In inveterate cancers, where great portions of glandular or fleshy substance were already corroded and melted down, the medicines above mentioned have not, within my observation, been of much significance. But this disease gives such early warning, that it may generally be obviated before it has made a very wide progress: in which case, time and experience will determine the just value of that method of cure which has now been described.

VII. *Of*

VII. *Of the Use of Ipecacoanha in Asthmas: By the same.*

Read at the COLLEGE, JUNE 6, 1767.

PHYSICIANS frequently meet with instances of extreme difficulty of breathing, where there is neither fever, nor catarrh, nor topical pain, nor any appearance, either of abscess, or obstruction, or dropfy in the chest. The complaint is most common in those whose thorax is ill formed, or narrow; but happens not rarely, even where there is no such obvious reason for it; in hysteric and hypochondriac persons, especially, in women labouring under obstructions of the catamenia, or arrived at that season of life when those evacuations begin to leave them. It is generally accompanied with a quick, small, unequal pulse. It is often very sudden in its attack, espe-

especially at night; when, in the midst of a sound sleep, the patient is awakened, as in the agonies of death. This last symptom does, indeed, sometimes happen to those who have water in the thorax: but the two cases are in general easily to be distinguished, by observing the habit of the body, the state of the urine, and the other signs which accompany the several species of dropsy. As the asthma, which we are considering, seems to consist in a stricture, or spasm, of the bronchia and membranous cells of the lungs, it is usually distinguished by the name of the convulsive, spasmodic, or nervous asthma.

I HAVE seen three instances where this disorder proved mortal, in as simple a state of it as can well be conceived. One, was a young woman of twenty-five, irregular in her catamenia; the second, a woman of sixty,
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who was in other respects perfectly healthy; and the third, a man about forty, of a thin and irritable habit. This last was subject to violent fits of asthma upon any sudden change of air, especially from warmer to colder. He died of it in the month of July, at night, in his bed, suddenly disturbed by it in a quiet sleep. I desired he might be opened. He had no water in his thorax, nor any thing præternatural in his viscera, except, that the lungs were rather of a deeper color than usual.

PROPER methods of treating this complaint are well known, and many valuable medicines, for resolving such spasms, have long been in general use. Where these have failed, and where there has been an appearance of imminent danger, I have had recourse to opium, and have been obliged to proceed to above an hundred drops of the Thebaic tincture, in a very short space

space of time. By this means, the patient's life has been saved; though the medicine, in one instance, occasioned a sort of fatuity, for two or three days afterward, and in another, brought on a degree of anasarca.

BUT when there is nothing, in the particular case, which can render the repeated action of vomiting unsafe, or improper, I know of no medicine so effectual, for removing the spasmodic asthma, as ipecacoanha; which I have now for several years been accustomed to give with this intention. Where I have found the patient in a violent paroxysm, I have ordered a scruple of ipecacoanha to be instantly administered: which failed not to procure great and immediate relief. But, in prescribing for the chronical or habitual indisposition, I give from three to five grains every morning, or from five to ten grains, every other morning, according to the degree of
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the disease, and without particular regard to any paroxysm: in which method I have sometimes persisted for a month or six weeks together. And though the patients are apt at first to complain both of the nauseousness and the fatigue attending it; yet, after a little experience, I have found them willing to acquiesce in it, or, where it had been laid aside, desirous to return to it. In a dose of five grains, the medicine generally acts as an emetic: on some persons, however, it has not that effect, nor produces any alteration in the stomach beyond mere sickness; which of course more frequently, indeed almost always, happens when only three grains are given. Yet in these instances I have found the medicine equally useful as in those where the same dose of it proved emetic. So that the relief, which it brings to the asthma, does not depend on the action

of vomiting; but seems owing to that general antispasmodic, or relaxing property which, as I have * elsewhere endeavoured to shew, belongs to ipecacoanha, and of which its emetic operation itself appears with great probability to be a particular consequence. From a variety of cases, where ipecacoanha was effectual, when the usual methods had either failed or had procured but a temporary and short relief, I shall select one or two of the more remarkable. The first was a woman about thirty, who in the winter of 1762, after a very severe lying-in, being much weakened and having a cough, along with a difficulty of breathing which often approached to suffocation, was for some time treated with other medicines, upon a supposition of her being unequal to the fatigue of repeated

* Comment. de dysent.

emetics. But making no progress with castor, or gum ammoniac, or squills, I at last ventured to prescribe half a scruple of ipecacoanha every other morning. She bore very well the fatigue of this method; and after continuing in it between a fortnight and three weeks, was perfectly cured of her asthma and cough.

THE other, whom I shall mention, was a man about fifty, of a swarthy complexion, and melancholy look. He had been addicted to excessive drinking, and, in the spring of 1765, was admitted into St. Thomas's hospital for a weakness in his stomach and a sinking of his spirits. When these complaints were somewhat relieved by lac ammoniaci, salt of hartshorn, and confectio cardiaca, he complained that a shortness of breath, which he had before been used to, was now much increased, and sometimes scarce to be borne. Having no

doubt that this was spasmodic, I ordered him five grains of ipecacanha every other morning. They puked him moderately, and his asthma grew sensibly better: till, after persevering in this regimen for the space of a fortnight, he found himself perfectly well as to his respiration. But, while he was repeating his medicine for the last time, in straining to vomit, there came a sudden swelling in one of his testicles, where some lymphatic had given way, and an hydrocele had been instantly produced. By his keeping in bed, and constantly using on the part a cataplasm of the boiled vegetables from which the fots communis is prepared, the swelling vanished within a fortnight, nor had he any return of his asthma.

CONCERNING this method there are slight and vague hints in several authors, though they relate chiefly or solely

solely to the humoral asthma. Riverius more particularly * insists on emetics as proper in that disorder, and appeals to frequent experience for their use. His reasoning indeed about their effects proceeds intirely upon a supposition, that the difficulty of breathing has its rise from a catarrh. But Willis † rightly distinguishes the convulsive species: which he imputes to the irregular motions of the animal spirits. He observes that an emetic in the midst of the paroxysm is useful; and gravely adds, as the reason, that the spirits cease to be disorderly in the lungs, when they are attacked or molested in other parts.

THIS distinction, however well founded, between the humoral and the spasmodic asthma, should not so absolutely take place as to exclude

* Prax. med. lib. vii. cap. i.

† Pharmac. ration. pars II. sect. i. cap. xii.

either of the two from being, in some degree, complicated with the other: at least catarrhs naturally excite spasms in the lungs; and though spasmodic asthmas are commonly observed without any catarrh, yet the removal of them, especially where ipecacoanha is given for this purpose, seldom fails to be accompanied or rather followed by a considerable expectoration. In other cases, where a discharge of this sort is necessary, and yet attended with more than ordinary difficulty, nothing so effectually promotes it as a just emetic. In the confluent small-pox, when the patient was almost strangled for want of spitting, I have, on the authority of * Sydenham, given a scruple of ipecacoanha (instead of his antimonial emetic); and after a day or two have repeated it, with very great benefit from the loads

* Observat. de morb. acut. sect. iii. cap. ii.

of phlegm which it brought up, too viscid and tenacious to be effected by any other method. But in the humoral asthma, this impediment seldom proceeds to so great an extremity; and more acceptable medicines are generally sufficient for the patient's relief.

VIII. *A Method of treating White-Swellings of the Joints: By the same.*

Read at the COLLEGE, JULY 6, 1767.

FEW disorders, upon their very first appearance, are apt to cause such a total despondency in the minds of practitioners, as those strumous or oedematous swellings in the joints, which, after a tedious and ill-conditioned suppuration, corrupt the synovia, shorten the tendons, make the bones carious, and destroy the articulation. As I have, in several instances, by applying blisters to the part, while the habit was assisted with alterative medicines, been able to restore the use of one or other of the principal joints where the case seemed very near to an anchylosis; it may perhaps be of use to select a few cases

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relating to the ankle, the knee, and the elbow. In a disease where physicians have so little in their power, the introduction of even a precarious method, of one that succeeds however rarely, is still an acquisition, and something added to the art. 'Tis hardly necessary here to premise that nothing can be expected from this treatment, where there is any sensible collection of a fluid within the joint.

IN the beginning of the year 1762, a young woman, between twenty-five and thirty years of age, was under my care for a white swelling in her left ankle. She was seemingly of a good habit of body, and had never before been troubled with any thing of the like kind. This swelling she had had about two months when I first saw her. It began without any sprain, or other apparent cause, in the joint of the ankle; but had now spread

spread over the whole foot and a little way up the leg. The joint was very stiff, and she felt pain when she tried to move it; so that she was almost wholly deprived of the use of her foot: but, while she sat still, there was no pain in it; nor had it any appearance of fluctuation. I ordered a blister to the part, so large as to cover the joint of the ankle and the whole upper surface of the foot. At the same time, she took two grains of calomel every night, and four ounces of the *infusum amarum simplex* twice a day. A few days afterward, while her blister was yet sore, and she on that account confined to her bed, a miliary fever seized her; which made it proper to change her medicines for others more suitable to her new complaint. Of this she got well in about a week, having had a large red eruption over her whole body, and the apices of the
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the little pustules having turned white before they fell off. It was now apparent that the blister had removed much the greater part of the swelling and stiffness from her ankle. She resumed, however, her former medicines ; and, after using them about three weeks longer, found the motion of her foot entire and without pain or impediment of any kind. Did the miliary eruption, in this case, contribute in any degree to resolve the topical obstruction and swelling ?

SOME time afterward, I observed at St. Thomas's hospital two instances of the success of this method, where the knee was dangerously affected. One was a lad between sixteen and seventeen ; who, about a year before his admission into the hospital, had got a spontaneous swelling round his left knee, by which the joint was at present enlarged to twice its natural size, and

and the motion of it almost entirely lost. Neither the leg nor the thigh were at all affected. I ordered a blister to be laid round the whole joint, and gave him a grain of calomel every night, with two ounces of the decoction of the Bark thrice a day. The swelling being considerably reduced by the blister, I made this perpetual upon the patella, and ordered his ham to be rubbed twice or thrice a day with neat's-foot oil, the use of which is familiar in the greater hospitals. It is prepared by boiling in large vessels the joints of horned cattle, and is found to be an useful application in pains and rigidities of the muscles and tendons. After this method had been continued for about ten weeks, the swelling and stiffness were in a great measure removed, and the use of the knee almost entirely restored.

ABOUT

ABOUT the same time, a man of five and twenty was admitted into the hospital for a like complaint. But his knee had been thus swelled and stiffened for four years, and he felt a constant pain on one side of the patella. I made his regimen the same as in the last case, except that his dose of the decoction of the Bark was three ounces, and that his blister was kept open for above a week round the whole knee. It was then gradually lessened, till its size was about two inches by three; and thus it was continually renewed with the unguentum ad vesicatoria, over that part of the knee where the pain lay. In less than two months the joint was nearly well.

THE last instance, which I shall relate, is more remarkable, inasmuch as the occasion of the swelling, together with the patient's habit of body, rendered his cure very unpromising.

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A young man about twenty, of an unhealthy and scrophulous disposition, had been some time under the care of a surgeon at St. Thomas's hospital, for a bad old sore, reaching from his ankle over the greater part of his foot. I had prescribed the decoction of the bark, and an electuary of camomile flowers, in order to correct the putrescent state of his fluids. Having continued for some weeks in the use of these medicines, he was seized with the confluent small-pox: through the whole course of which, I directed that he should persevere in his former regimen. He did well: but, a few days after he had taken his fourth dose of purging physic, there was discovered round the joint of his right elbow a scrophulous swelling, which already had nearly deprived it of its motion. I ordered the whole joint to be covered with a blister, and, along with his decoction
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of the Bark thrice a day, gave him a grain of calomel every night. In two or three days, the blister having had its effect, the swelling appeared to be greatly lessened, and the elbow much more flexible. Some stiffness however remained, the tendons being somewhat contracted, and the joint itself still oedematous. On this account, I ordered a perpetual blister to the outside of the elbow, and that the tendons should be frequently bathed with neat's foot oil. In less than a fortnight the use of the joint was perfectly restored. I found afterward that the sore in his foot had made an amputation necessary: but he had no return of the disorder in his arm.

IX. *A Letter from Mr. T. LANE,
F. R. S. to W. HEBERDEN, M. D.
F. R. S.*

Read at the COLLEGE, JUNE 6, 1767.

S I R,

THOUGH the many experiments made by ingenious and learned men, upon the several ingredients contained in Mrs. Stephens's medicines, have proved that lime and alkaline salt are the most, if not the only, active principles for the cure of the stone, in that nauseous farrago; yet the enquiry appears to me to have been dropped without obtaining that certainty to which a few more experiments may conduct us.

It is true the present practice almost universally gives the preference to a lixivium prepared from these two ingredients; as a composition, by far the most

most agreeable to the patient, equal at least in efficacy, and more elegant in its form, than any other medicine of the same kind. But here the investigation is ended, and various receipts are published for making the best lixivium for this purpose, without any material reason assigned by any one author, for the peculiar method he directs. The specific gravity of these preparations is also so different, that the proper dose must vary greatly in all of them, except the lixivium of the London Dispensatory, where particular care is taken to ascertain its weight.

THE uncertainty of these preparations induced me to make a particular enquiry into this subject. The effects of my experiments upon each of the ingredients singly, and by various combinations of them, in different proportions, are carefully and exactly recited in the following relation.

ANY uncertainty in my experiments, from a variety of accidental differences in the subjects of trial, I have endeavoured to obviate by the following method.

Previous to any of the experiments :

1. A SUFFICIENT quantity of well-calcined lime was reduced to powder, from which the lime necessary for the experiment was exactly weighed: for not only different pieces of lime, but even different parts of the same piece, are often very unequally calcined.

2. THE pearl ashes were reduced to powder, that the purity might be equal in the several parts of the whole.

3. THE human calculus used, was also reduced to powder, that the surface, and the parts acted upon by the solvents, might be as similar as possible in all the experiments, be-

cause not only different calculi are more or less soluble, but even different laminæ of the same calculus:

EXPERIMENT I. One part of pearl ash was dissolved in eight parts of water, and the solution filtered.

To ℥iiss of the above solution were added, gr. vj of calculus; and after remaining together in a phial, closely stopped, 12 hours, the whole was put into a filtering paper; what remained in the paper, was well washed with distilled water: and then the paper, with the undissolved powder, was dried before a gentle fire, when there remained six grains as before.

EXPERIMENT II. Limewater made of chalk lime, one part to 16 of water was filtered.

To ℥iiss of this water were added six grains of calculus; and, after standing 12 hours, they were put into filtering paper, and when deprived

prived of a moisture, there remained only $3 \frac{1}{16}$ grains *.

THESE experiments were repeated without any variation in the event, from which it appeared that a solution of alkaline salt possesses no lithontriptic power in itself. I therefore proceeded to try the dissolving power of lime and salt mixed in various proportions.

EXPERIMENT III. Lime and pearl ash were mixed together, in the following proportions, with boiling water, each distinguished by the following letters:

a	lime	℥j	water	℥viiij	salt	℥j
b	—	℥ij	—	D°	—	D°
c	—	℥iiij	—	D°	—	D°
d	—	℥iv	—	D°	—	D°
e	—	℥vj	—	D°	—	D°
f	—	℥viiij	—	D°	—	D°

* The scales used for these nice parts of the experiments would easily determine to $\frac{1}{16}$ of a troy grain.

THESE

THESE remained in phials, closely corked, 24 hours; and then were separately filtered.

℥ss of each of the above was put into separate wine glasses, and to each were added 8 grains of calculus; and after standing five hours, they were poured into fix filtering papers, adding to each ℥ss of distilled water, to wash all the undissolved calculus out of the glasses into the paper.

WHEN all of them were dried, they were found in the following state.

				grains.					grains.
Of	<i>a</i>	there remained	$6\frac{3}{8}$	} so the quantity dissolved was,	of	<i>a</i>	$1\frac{5}{8}$		
	<i>b</i>	-	$5\frac{1}{4}$			<i>b</i>	$2\frac{3}{4}$		
	<i>c</i>	-	$2\frac{1}{8}$			<i>c</i>	$5\frac{1}{2}$		
	<i>d</i>	-	$\frac{3}{4}$			<i>d</i>	$7\frac{1}{4}$		

In the papers of *e* and *f*, the residua were so small as not to be subject to the trial of the balance, there being only a stain left on each paper, the greater stain being on the paper *e* where the proportion of lime was less.

EXPERIMENT IV.

<i>a</i>	lime	℥ij	salt	℥ij	water	℥vj
<i>b</i>	—	℥iv	—	D°	—	D°
<i>c</i>	—	℥vj	—	D°	—	D°
<i>d</i>	—	℥viij	—	D°	—	D°

I prepared the mixtures of Experiment IV. by this method.

THE lime was first flaked with twice its weight of water; and when the heat began to abate, the salt was added; then they were well stirred together; and when the mixture was quite cold, more water was added, so as to render the whole barely fluid, which was now put into a bottle and corked, where it remained for 24 hours. The remainder of the water was added, and the mixture well shaken.

The next day I examined each, and found that *a* alone contained fixed air, and that but a small quantity, by its slightly effervescing with vitriolic acid, which none of the rest would do;

do; but by remaining 48 hours on the lime, it was now as free from fixed air as the rest.

To an equal quantity of *a*, *b*, *c*, and *d*, when filtered, were added to each 8 grains of calculus; and after standing 3 hours and $\frac{1}{2}$, the quantities remaining undissolved by *a*, *c* and *d* were exactly equal, the residuum left by *b* weighed $\frac{1}{2}$ a grain more, which was probably owing to this circumstance, that the glass in which it was infused was found narrower, so that the surface of the calculus, exposed to the action of the lixivium, was less than in the other glasses.

EXPERIMENT V. Having evaporated some lixivium, I obtained a caustic salt, which contained but a very small quantity of fixed air. To $\mathfrak{zj}$ of this salt was added an equal quantity of lime and 7 ounces of water:

At the same time was made a lixivium with lime and pearl-ash each

I 4

$\mathfrak{zj}$,

℥i, water 7℥; both were mixed together as in Experiment IV.

THESE were found equally free from air, but the specific gravity of the lixivium made with the caustic alkali was greater than the other. The first was therefore diluted with so much water, as to bring it to the same specific gravity.

To an equal quantity of each were added 10 grains of calculus; and after remaining seven hours, the quantity undissolved was in each equal.

EXPERIMENT VI. I next made the following mixtures, *a* and *b*.

a. Oyster-shell lime ℥iij, salt of tartar ℥j, water 1 pint.

b. Chalk-lime ℥iij, salt of tartar ℥j, water 1 pint.

Each of the above were mixed as in Experiment IV. and were both equally free from air.

To equal quantities of each were put 10 grains of calculus; and after
7 standing

standing 3 hours, the quantity left undissolved by each was equal, viz. grains $3\frac{9}{16}$.

THE above experiment was repeated with lime, made from marble, chalk, and oyster-shells, in each of which the lime was equal only to the weight of the pearl-ash; also a third Experiment with stone-lime, sent me from Bath; but no difference remarkable was observed.

EXPERIMENT VII. Two lixiviums were made, one with salt of tartar zj , lime zij , water lbj , the other with pearl-ash zj , lime zij , water lbj . The specific gravity of the lixivium from salt of tartar was the greatest; so that it was necessary to dilute it, to bring it to an equality with the other in that respect.

The quantity of calculus dissolved in equal quantities of each was found equal.

I NEXT compared a lixivium made with the mineral alkali obtained by crystal-

crystallization, from the blue Spanish ash barilla, with another lixivium made at the same time with pearl-ashes.

To equal quantities of each were added 12 grains of calculus, and there remained undissolved by the mineral alkali

grains $5\frac{3}{4}$

pearl-ash — — — $\frac{13}{16}$

This same experiment was made with the native mineral alkali you were so kind as to favour me with, when the quantity undissolved by the mineral alkali

grains $3\frac{1}{2}$

pearl-ash — — — $0\frac{1}{2}$

THE volatile alkali was mixed with three times its weight of lime, as in Experiment VI.; and though this lixivium was free from fixed air, it had not the least apparent effect on the calculus.

From Experiments I, III, IV, and V, it appears that fixed alkaline salt possesses no power of dissolving a calculus,

culus, before it be deprived by means of lime of some of its fixed air *; and that the more the salt is deprived of this air, the greater its solvent power becomes; but, if more lime is used than is sufficient to attract the whole of its fixed air, the superfluous part does not seem to add to its solvent power.

FROM Experiment VI, we may conclude that a lixivium may be made with equal advantage, as a solvent for the stone, from chalk, marble, limestone, or oyster-shells, if they be all properly calcined, and the necessary proportion of any of them taken to free the salt from its fixed air.

FROM Experiment VII, we can infer no difference between salt of tartar and pearl-ashes. But the last is so often loaded with impurities, that it is best to use the salt of tartar.

* See Dr. Black's paper on magnesia, and quicklime, &c. *Essays Physical and Literary*, vol. ii.

THE mineral alkali, treated in the same way as the vegetable, proves greatly inferior to it; from which it may naturally be inferred, that when soap is directed as a medicine for the stone, the *sapo amygd.* of the London Dispensatory is to be preferred to any soap made with the Spanish ash *barilla*; and more especially so, as the *lixivium* directed by the College is, if rightly prepared, void of fixed air.

I am Sir, with great respect,

Your much obliged

humble servant,

Aldersgate-Street,
June 23, 1767.

T. LANE.

X. On

X. *On the Operation of Mercury, in different Diseases and Constitutions: By EDWARD BARRY, M. D. Fellow of the College of Physicians, and of the Royal Society.*

Read at the COLLEGE, JULY 13, 1767.

THE operation of mercury, when received into the circulating fluids, can only be explained from the known properties of this mineral, and the situation and structure of the vessels, to which it is determined in the greatest quantity, and with the greatest activity.

PURE mercury acts on the circulating fluids, by its gravity, and fluidity, or easy divisibility into smaller globules, which are thirteen times heavier than those of the blood; and, by these prevailing qualities, must, in their course of circulation, greatly divide and dissolve the blood,
and

and the other humours; by which means they will occupy more space than when compacted, be more easily capable of rarefaction, and necessarily distend the vessels beyond their usual tone.

THE quality of the humours being rendered more attenuated and acrid by this dissolution, the stimulus of the mercurial particles will likewise add to the irritation of the vascular system, and therefore make some subsequent evacuation necessary and unavoidable.

THIS dissolution will first prevail, and be continued in the greatest degree, through such vessels, where the mercury is determined in the greatest quantity; and the evacuation will chiefly be produced, where there is the least resistance, where the excretory glands are most numerous, and their orifices most large.

BEFORE I attempt to explain what course the mercurial particles will chiefly

chiefly take, and what effects produce, when mixed in any given quantity with the blood, expelled from the heart, it will be necessary to take a short view of the situation and direction of the aorta, proceeding from the heart, and of the principal vessels arising from it; an attention to which is absolutely necessary, to explain how mercury is more particularly apt to excite a salivation, and how its operation is differently determined to several parts of the body; which, as far as I can recollect, remains unexplained, by any writer on the subject; some have acquiesced, in supposing the mercurial particles to have acquired a more corrosive quality, from the contact of the air admitted there to them; and Astruc*,

* “Cur mercurius salivationem moveat sæpissime? quod sane explicatu difficile. Cur non semper moveat? quod explicatu forsitan difficilius.” De Morb. Vener. Lib. II. Cap. vi.

who

who seems to have considered this subject with more attention and judgment than many others, expresses the difficulty of explaining this part of its operation, and why it produces this particular evacuation in some, and fails in others; and at last imputes it to a sort of sympathy, between the mercurial particles and the glands of the mouth.

THE following description of these principal vessels is taken from Haller*, who with the same accuracy describes their various ramifications.

THE aorta, in its origin from the heart, forms a considerable curvature, from which three principal vessels arise; the first is almost immediately divided into two ramifications, the inferior of which forms the right subclavian artery; the other ascends on the side of the larynx to the brain, and forms the right carotid

* *Primæ Linae Physiolog. Cap. xii.*

artery;

artery ; the left carotid artery proceeds from the next contiguous part of the arch, and forms the left subclavian, but more inclining than the right.

EACH carotid artery, in its ascent, distributes no ramifications, till it arrives to the superior part of the thyroid cartilage, and then separates into two branches ; the anterior of which, and the largest, forms the external carotid, which, in its extended progress, gives various ramifications to the internal muscles, membranes, vessels, and glands of the mouth, to the parotid glands, and some few to the muscles of the neck, and to the brain ; but the posterior, internal carotid, proceeds directly to the brain, without giving any ramifications.

THE vertebral arteries arise from the subclavian, very near their origin, and proceed, without any ramification,

fication, to the aperture formed for their reception, by the transverse processes of the vertebræ of the neck, and, proceeding in a winding ascent through these processes, transmit through each of them ramifications to the external muscles of the neck, and some adjacent parts; but almost entirely convey their blood, through the great foramen of the cranium, to the brain.

IN whatever form mercury is taken inwardly, or externally applied, to be received into the blood, it must pass either through the lacteals, or the absorbent veins on the surface of the body; and which, by the known laws of circulation, must at length be conveyed into the vena cava, into the right ventricle of the heart, into the pulmonary arteries and veins, to the left ventricle of the heart, and thence into the aorta.

As

As yet there can be no secretion, or excretion, of the mercurial particles; there cannot be any from the venous system, or the pulmonary arteries, which have no excretory glands (for these, which separate the mucus on the internal membrane of the lungs, derive their vessels from the bronchial artery); and the mercurial particles, mixed with the blood, must therefore successively, and entirely, be received into the aorta.

WHEN any quantity of blood is expelled from the left ventricle of the heart into the aorta, it will be conveyed into the different vessels arising from it, in proportion to the different size of their orifices, and the direction given to it; but the mercurial particles with it, from their superior gravity, moving with the greatest force, and nearest the axis of the canal, will, therefore, in a greater quantity, enter into such vessels,

fels, which, from this direction, and their situation, are most disposed to receive them.

It is impossible, with any certainty, to estimate in what proportion the mercurial particles, mixed with the blood, are determined to these vessels; a more minute enquiry, or geometrical computation, from the different areas of their orifices, situation, and other circumstances, would render it perhaps more exact, but may be liable to many intricacies, and particular objections: neither is it necessary, as from the known structure, size, and situation of those vessels, and the properties of mercury, its operation through them may be evidently explained.

THE carotid arteries, which are nearest to the heart, will not only receive a quantity of blood and mercurial particles, in proportion to their orifices and direction, but will likewise

likewise receive an additional quantity from the peculiar structure of their orifices. For * Lower justly observes, that the right side of them projects more than the left, and thence intercepts a considerable part of the blood, which otherwise would not enter into them, if the sides of their orifices were of an equal height. And as the blood, impelled on this right side, is thence reflected, it will, in its course and ascent, be more apt to pass with a greater quantity of mercurial particles, into the external, than into the internal carotid. And this particular structure, and winding ascent of the carotid artery, is not only necessary to prevent the blood from being impelled with too great a force on the brain, but to

* Quippe latus arteriæ cujuslibet dextrum, sinistro multo elatius est, unde liquoris in majore trunco diffusi pars aliqua intercipi oportet. Lower, de Corde, cap. I. vide Tab. I. Fig. V.

direct some of the most volatile and active parts of it, more safely to the external, than internal carotid. On which account, such who use spirituous liquors, or in whose blood, volatile, active salts prevail, are particularly liable to eruptions on the face, while other parts of the body remain entirely free from them.

THE subclavian and vertebral arteries, in proportion to their orifices, and direction (which is more oblique than that of the carotids), will receive a quantity of blood, and mercurial particles; and the remaining part of the blood, will be determined to the descending trunk of the aorta, not only in a larger quantity, but with a large proportion of mercurial particles, for it is evident from its structure *, that the blood imme-

* Aorta (vario tamen in diversis discrimine) plurimum inflectitur: quo fit ut incurvatus iste angulus sanguinis ejecti impetum et primum ictum

diately flowing into it from the heart, is directly impelled on the incurved part of the aorta, before any ramification arises from it; and must therefore, in a reflected angle and direction, be determined to the descending trunk. Whatever quantity of mercurial particles, is received with the blood into the external carotids, from their situation and structure, thus disposed to receive them, will be directed to their various ramifications, but chiefly to those which are more largely distributed to the internal parts of the mouth, and salivary glands, and the evacuation subsequent to the dissolution of the humours, must necessarily succeed from their excretory ducts, and where the resistance is least.

sustineat, et maximum ejus torrentem versus aortæ truncum descendente dirigat. Lower, de Corde, cap. I. et Tab. I. Fig. IV.

HENCE it evidently appears, that the effects of the mercurial particles, expelled with the blood from the heart, into the aorta, will more immediately be produced in the glands of the mouth, and particularly the salival, which are most numerous, and whose orifices, from their habitual and more constant excretion, are most enlarged; and that a salivation must (*cæteris paribus*) be the necessary and more immediate sensible excretion.

THOUGH the operation of mercury, is universally the same in every part of the body, yet the effects of it will certainly be more sensible and greater, when confined within a small space and surface, than when diffused through a greater; and whoever reflects on the very great difference between the area of the excretory vessels of the mouth, and salival glands, derived from the external
I carotid

carotid arteries, and of those which are derived from the descending trunk of the aorta, which are universally spread over the external surface of the body, and of the internal cavities, will easily apprehend, why mercury thus diffused, through these extensively divided vessels, must then act chiefly as a dissolvent, and deobstruent, and more moderately and equally enlarge the principal discharges, especially from the skin and kidneys, while it must excite a greater and more sensible evacuation, when particularly determined to the salival glands, which are contained within so small a surface.

THE mercurial particles, mixed with the blood, which are conveyed directly to the brain by the internal carotid and vertebral arteries, will return again, by the jugular veins, to the heart and to the aorta, almost entire, without producing any sensible

sible evacuation, as there are no excretory ducts from the vessels of the brain to discharge them ; and in this course of circulation, the mercury may act as a most powerful deobstruent, and dissolvent, but cannot produce any sensible evacuation. How far it is capable of pervading this system of vessels, I shall not attempt to determine ; but it is more than probable that it does not pass through the last excretory ducts, which are the nerves.

THERE is likewise a remarkable difference between the time, in which mercury received into the superior ascending vessels of the aorta performs its circulation through them, and returns again by the jugular veins to the heart, and that which is required to compleat the circulation of it, through the more various and extended vessels derived from its descending trunk, and its more slow
return

return by the veins to the vena-cava and heart. The whole quantity of mercurial particles, which the former receive (except what passes from the excretory glands, and vessels of the external carotids), returns almost entirely to the heart, and therefore with a more strong and repeated force exerts its operation through them; whereas that quantity which passes through the vessels of the descending trunk, being more equally divided, returns more slowly, and in its course discharges a great part by sweating, and urine, or by purging, when particularly determined to the intestines, whose excretory vessels and glands are derived from the mesenteric arteries.

FROM hence the operation and effects of mercury, in the lues venerea, and in different diseases and constitutions, may be more evidently explained and determined.

WHAT-

WHATEVER is the particular nature of the poison, which produces the lues venerea, it can only be cured by some specific, which by its peculiar properties is capable of correcting or destroying it ; or by such medicines, which, by dissolving the fluids, disengage more freely the poison mixed with them, and, by successive evacuations, at length discharge it entirely from the body.

HENCE it appears, that mercury does not act as a specific in curing this distemper, but by its known properties of gravity and fluidity ; and that, if gold could be rendered equally fluid, its operation would be probably stronger than that of mercury.

HENCE likewise may be explained, why mercury will, in some constitutions, easily excite a salivation, and with so much difficulty in others. The former will be the case of such, whose

whose fibres are most relaxed, and nerves more irritable, and where the texture of all the fluids is weaker, which therefore will easily yield to the operation of the mercurial particles, sooner acquire a sufficient degree of dissolution, and, when determined to the excretory vessels of the mouth, will, in a less quantity, excite an excretion from them: whereas, in strong constitutions, and rigid fibres, the natural tenacity of the blood gives a greater resistance to the operation of mercury, is apt to excite a fever, and inflammatory pains, especially in the head, and requires more time, and a larger quantity, to produce a sufficient dissolution of it. On which account, in such cases, previous evacuations, warm bathing, and a diluting regimen, ought always to precede the use of mercury, to make its operation more safe and effectual, which is unnecessary,

cessary, and very improper, in relaxed and weak constitutions, where the fluids are naturally in a more dissolved state.

HENCE likewise it is evident, that mercury, when internally taken, or externally applied, will act more safely and effectually, when repeated in small quantities, and for a greater length of time, than when taken or applied in larger quantities, and for a shorter space of time; for in strong constitutions, by exciting too great a degree of motion and heat in the blood, instead of dissolving, it will increase the tenacity of the blood, especially when succeeded with an inflammatory distension of the membranes of the salival glands, and adjacent vessels, by which means the venereal infection will be more involved in the fluids, from the defect of a sufficient dissolution of them. This has been too often experienced by those who have passed through
such

such a violent, painful, and yet ineffectual course. In weak constitutions, the mercury, unless cautiously repeated, and in small quantities, will be apt to excite a salivation before the fluids can be sufficiently impregnated with it, to disengage the poison, and pervade the distant vessels of the body.

HENCE likewise may be explained the different operation and effects of pure mercury, when received into the blood, and of the artificial preparations of it. These will, perhaps, appear in a more clear light, by taking a short view of the original use of this medicine, and of the effects observed from the different application and preparation of it.

MERCURY was well known to the ancients before it was used as a medicine. * Dioscorides and † Galen

* Δύναμιν δὲ ἔχει φθαλίαν ποθεῖσα τῷ βάρει δια-
ξερῶσκει τὰ ἐν αὐτῷ. Dioscorides, Lib. V. cap. cx.

† Τὰ κατὰ διάθεσιν ἀναιρῶντα φάρμακα προσείκει
ὑπὸ τῆς ἐν αὐτῷ σώματι θερμοσύνης εἰς τὴν ἀγόμενα

condemned it, as being poisonous and deleterious : it was, therefore, by these powerful authorities, long banished from the *Materia medica*; the Arabians first ventured to direct the external use of it in the itch, and several cutaneous eruptions and ulcerations.

FROM the analogy observed between these cutaneous appearances, and such which attended the lues venerea, when it first began to rage in Europe, applications of quicksilver, in various forms, were tried, and attended with great success, when conducted with caution and prudence ; but the unguarded and large use of them, as then directed by many physicians, and by most of the empirics, was succeeded with

δηλονότι καθάπερ ἢ τε χαλκίτις, καὶ τὸ μίση, καὶ τὸ σῶρι, καὶ πρὸς τέτοις ἀρσενικῶν, ὑδράργυρος, λιθιάργυρος, καὶ ἕτερα μύρια. Galen περὶ τῶν ἀπλῶν φαρμακῶν δυνάμειος Βιβλίον δ. Vol. II. Fol. 28. of the Aldus Edition.

such

such bad, and often fatal consequences, that several writers at that time as much condemned this practice, as it was practised by others. I shall only mention Huttenius *, one of undoubted credit and learning, and who had himself unsuccessfully passed through several courses of mercurial unctions. He emphatically describes the effects, which then often succeeded that regimen : many died in the operation, several relapsed, and the greatest part of them miserably languished afterwards, with an obstinately prevailing putrefaction in all the humors, a perpetual foetid breath, a destruction or paralytic weakness of the organs of speech, a relaxation of all the solids, and particularly of the stomach and bowels, loss of appetite and digestion, thirst, and a gradual decay ; the head was particularly affected, in some with

* De morbo Gallico.

pain, in others with giddiness, and in some with madness.

It is not therefore surprizing, that other methods were attempted. Strong decoctions of the lignum guaiacum relieved many, and, when continued in large quantities, with a proper regimen, were found effectual, where mercurials had failed: the sarsaparilla and China roots, and afterwards the sassafras, were imported, and by many much recommended; but their virtues were often found unequal to the malignity of this distemper, and the use of mercurial unctions again generally prevailed; but more under the direction of prudent physicians than empirics, who, by directing them with caution, and a proper regimen, established this practice on a better foundation: there are several forms remaining of their mercurial liniments, then used, in which the quantity of quicksilver did

did not exceed the fourteenth or fifteenth part, and the strongest not more than the seventh or eighth part.

THE external use of mercury had long thus prevailed, before it was directed in any form to be taken internally, as it had been condemned by Galen as poisonous*. Joannes a Vigo first mentioned, and gave the process of a preparation, which he calls a red precipitate, which he had used with success, as an external corrosive, in obstinate ulcers; but in another † treatise, which he afterwards published, he recommends the internal use of it, in the quantity of two grains, mixed with the philonium Persicum in colics, and the iliac passion, and calls it “*mirabilis et egregia medicina.*” It is probable that he took the hint of this preparation

* In Antidotario, lib. viii. cap. 13.

† Chirurg. Compend. lib. v.

from a passage of Paulus Ægineta, who says, “ that quicksilver being *
 “ poison could not be used as a me-
 “ dicine; but that, after being burn-
 “ ed, reduced into ashes, and mixed
 “ with other ingredients, some had
 “ given it in colics, and the iliac
 “ passion.” However, Paulus does
 not say that he ever directed it inter-
 nally, but that some others had given
 it; neither does even Joannes a Vigo
 attempt to establish it by any in-
 stances or facts. It is certain the use
 of it never prevailed, and that it was
 universally condemned by the phy-
 sicians of his time.

THE first internal mercurial medi-
 cine, which obtained any real credit,
 were the famous pills of Barbarof-

* Ὑδράργυρος μὲν εἰς ἰατρικὴν χρῆσιν οὐ πᾶν τι φέρεται
 δηλητήριον ὧν τινὲς δὲ καύσαιτες αὐτὸν ὡς τεφρωθῆναι, καὶ
 μίξαντες ἑτέροις εἶδεσιν ἐπὶ κολικῶν τε καὶ τῶν εἰλεωδέων
 ἐδίδωσαν πειν. Paulus Ægineta, lib. xvii. ἐν ἀρχῇ
 τῆς ὑ.

fa, composed of quicksilver, rhubarb, diagrydium mixed with musk, and amber, formed into pills, each of which contained about four grains of quicksilver; but more safe and effectual preparations of this mineral, by the improvements in chemistry, were soon afterwards known, and often successfully used, which have since supplied a variety of them, of various force and efficacy.

As pure mercury has properties very different from the artificial and chemical preparations of it, and as these are various, and of different force; such general rules may be deduced from their evident qualities, and the laws of the animal œconomy, which will with more certainty determine their different operation and effects, in different diseases and constitutions.

PURE mercury, when received into the blood, being soft, and free from

acrimony, will in the course of circulation act on the solids and fluids, only by its gravity and fluidity, and will be diffused through the several decreasing series of vessels, in proportion to the momentum which the blood receives from the moving powers of the heart and arteries; and, as its weight is thirteen times specifically greater than that of the blood, it will, in the more distant vessels, where the force of circulation gradually decreases, either stagnate, when its resistance is equal to the moving powers, or pass off by some of the larger excretions.

It will therefore, in low and relaxed constitutions, be apt to pass off chiefly through the glands of the mouth, and excite a salivation, or by the mesenteric or renal vessels, and excite a purging or increased discharge of urine, before it can pervade and exert its influence in the more distant

distant vessels, where either the obstructions or seat of the infection frequently lie; and will therefore, in these constitutions, require such a regimen as will more equally enlarge the circulation, diffuse its influence through the decreasing series of vessels, and promote all the excretions and secretions, and especially those of the skin, by a free and sensible perspiration, which must always be considered as the most beneficial and effectual evacuation.

IN such constitutions, the mercury ought to be received, and repeated in moderate quantities, and at a due distance, which will make its operation more effectual, and less liable to any future bad effects, which indeed are almost unavoidable, as it leaves always the solids more relaxed, the humors more dissolved and putrid; on which account, it is more particularly pernicious to such constitutions,

when likewise attended with a scrophulous habit of body.

HENCE it is evident, that a salivation is not necessary to make the operation of mercury more effectual, either in dissolving the blood, promoting the principal evacuations, or improving its deobstruent qualities; and that all partial, quick, and large evacuations, succeeding the use of it, must render its operation more uncertain and dangerous.

HENCE it appears, that mercurial unctions, directed with a proper regimen, will be more safe and effectual, in strong than in weak constitutions: for the force of circulation in the former will more freely diffuse it through the arterial system, and promote more equally the principal evacuations, especially those from the surface of the body; and their vessels will more easily afterwards recover their natural tone, and the humors
2 their

their consistence. But the motion of the blood must, in such, be cautiously kept within proper and temperate limits; for a greater velocity and strength in the pulse, always succeeds the first admission of mercury into the blood, and a previous dissolution of it; and when the operation proceeds well, and the circulation is more equally enlarged, the pulse becomes remarkably equal, soft, and calm; whenever therefore this motion does not subside, but increases, especially when attended likewise with a local inflammation in the vessels, and glands of the mouth, the blood will certainly acquire an increased tenacity, which will oppose and prevent the natural operation of mercury, as a dissolvent and deobstruent: this not only renders its operation more ineffectual and dangerous, but has often laid the foundation of subsequent invincible disorders; and I am
well

well persuaded that many instances of a caries of the bones, and of the spina ventosa, which have succeeded mercurial unctions, have been owing to an improper and large use of them, and that few instances are known in these northern climates, where these distempers are produced by the virulence of the infection; nor do I remember one case of this kind succeeding the use of the artificial preparations of mercury. I shall here mention a remarkable case of a young gentleman, who passed through a large course of mercurial unctions, in the year 1722. About six weeks afterwards, he went to Bath, drank the waters, and lived freely; a new salivation returned, attended with a fever. I visited him about three years afterwards; he then complained of a constant weight, and sometimes a violent pain in his head; mild evacuations, and a temperate regimen, had given him

him a temporary relief: but the same complaints continued obstinate and increased during his life, attended in their progress with several protuberances on the superior parts of the cranium, and all the genuine marks of a *spina ventosa*. I early advised the application of caustics to open them, but he would never submit to the operation. He died in the year 1758; his head was opened by Dr. Blair, who now resides at Cork in Ireland: he sent me an account, that he had found the internal tables of the skull in several places carious, with a putrid imperfect supuration in the diploë: this progress, thus surprizingly, continued gradually to increase thirty six years. He was married for some years, but had no children, nor did his wife receive any infection from him. Dr. Blair did not mention any collection of quicksilver which he had discovered between

tween the tables of the cranium, or that he had searched for it.

A CASE of this kind, but succeeded with a different event, was sent to me in the year 1737. This person had several protuberances in the superior parts of the cranium, which slowly succeeded repeated mercurial unctions, attended at length with violent pain, hectic heats, and an unquenchable thirst: I advised the application of a caustic, successively to these rising inequalities of the cranium; the internal tables were found carious; during this course, he came to me from the country, to be more immediately under my care; some parts where the caustic had been applied had exfoliated, and were healed: and at that time part of the bone, to which the caustic had been lately applied, was loose, and ready to separate: I immediately directed him to return to the country, where he had

had the particular assistance and care of his brother, who was an eminent surgeon, and from whom I received regular accounts of the regimen he pursued. He recovered, and continued free from the pains in his head, and hectic symptoms, and died four years afterwards of an ascites. He was married after going through the mercurial courses, had four children living, and neither they nor his wife had ever received any infection. There is no doubt that the spina ventosa formed in these cases, between the tables of the cranium, was owing to the quicksilver propelled into them by a violent circulation, which had stagnated in their cellules, as no infection remained in the blood; and though no mercurial particles were discovered there, and probably not searched for, yet books of observations abound with instances of this nature, where mercury has been found,
and

and in some in almost an incredible quantity *.

THOUGH the artificial preparations of mercury are very various, yet as they all chiefly differ in their degree of pointed acrimony, their different operation and effects in different diseases and constitutions may be thence determined; and why such which, by their greater activity, would in a certain quantity be pernicious, or destructive, may in a lessened quantity with a proper regimen be rendered less active and more effectual, and even powerful though mild deobstruents. May not the operation and surprizing effects of the solution of the mercurius sublimatus corrosivus, in some particular obstinate diseases, be hence explained? for, when

* Vide Joan. Fernel. in Lue Venerea, cap. vii. Gabriel. Fallop. Tractat. de Morbo Gallico, cap. lxxviii. Joan. Langium, Epist. lib. i. Epistol. 43. Alexand. Petron. de Morbo Gallico, cap. i. lib. vi.

dissolved, greatly subtilized, and taken in very small quantities, with large dilution, it will be rendered not only less active in the larger system of the arteries, but more capable of entering the most distant minute vessels, to which no other preparation of that mineral can arrive, as its more active stimulus will excite such vibrations in them as will be sufficient to enlarge the circulation through them, and make its force superior to the resistance of the mercurial particles, and by a more pointed acrimony, added to their weight, make them more capable of pervading and disengaging them: how far this medicine may be therefore more capable of disengaging local obstructions than a general infection, future observations and experience must determine.

BOERHAAVE* was early acquainted with the efficacy of this medicine, in

* Element. Chem. Process. cxviii. p. 587, 588.
obstinate,

obstinate, and generally incurable distempers; but with the severest caution recommends the use of it, only to the prudent physician, who is able to direct it, with a suitable regimen. The solution he mentions, is made by dissolving one grain of the sublimate, in one ounce of water, a drachm of which (containing only the eighth part of a grain) is to be taken in divided doses, two or three times in a day, softened with syrup of violets. I shall add his own words, which are more expressive, “ Si drachma talis
“ misturæ, syrupo violaceo mitigata,
“ potetur bis terve de die, mira præ-
“ stat in morbis incurabilibus: at
“ prudenter, a prudente medico! ab-
“ stine, si methodum nescis!” It was long afterwards recommended by Van Swieten, and since used by the German physicians in the hospitals at Vienna, and now more universally, with various success.

I SHALL

I SHALL here add a remarkable instance of the different effects of mercurial unctions and this medicine, in a difficult and singular case. A young gentleman, of about twenty years of age, in 1764, was advised to a course of mercurial unctions, by an eminent surgeon; who directed them with more than usual caution and judgment, as he observed that whenever the ointment was used, he never rested one moment that night: at length he became feverish, sullen, morose, and obstinate, with strong appearances of an approaching mania. In these circumstances, I first saw him; his pulse was quick and strong, his tongue white, and urine high-coloured, and an inflammatory painful swelling lately appeared on his elbow. Ten or twelve ounces of blood were taken from his arm, which was very much inflamed; we directed a decoction of the sarsaparilla,

la, with a lenient, diluting, opening regimen, and omitted entirely the unctions, which had not been used for two or three days before I saw him. In a few days all these symptoms disappeared, and his natural temper and chearfulness returned. As a virulent ulcer in the tonsil, extending towards the palate, had become more favourable by the mercurial unctions, we chose to continue for some time this regimen; and, as the weather was warm, he was allowed to go into the country for a few days, three or four miles distant from town. The venereal symptoms continued favourable for some days, but returned with a rapid progress. The ulcer had spread and inflamed; he swallowed his drink with great difficulty; the right wing of the nose was much swelled, and an oozing of an acrid ichor had formed a rising scab, which covered the whole surface

surface of it; there was the same frightful appearance over the eyebrow. In these difficult circumstances, we agreed to try the efficacy of the solution of sublimate, and directed the quantity of one grain to be taken in divided doses, in twenty-four hours, in a decoction of sarsaparilla; he was kept moderately warm, and diluted freely. In three days the difficulty of swallowing ceased; the ulcer became more favourable, and confined in its progress; and, by continuing this regimen, with some light variations, in three weeks he was entirely free from any complaints; and has been since that time perfectly well.

I SHALL not exceed the limits of this paper, by attempting more particularly to explain how far the different preparations of mercury may be made the most powerful alteratives and deobstruents in different diseases

and constitutions, especially in some chronic diseases of the head, to which, from its evident qualities, and the structure and situation of the great vessels directed to the brain, it is more particularly determined; but its efficacy may be greatly increased by combining it with other alteratives, and chiefly with the Peruvian bark, which not only improves its operation as a deobstruent, but, by being powerfully antiseptic, will prevent that putrid disposition, which the animal fluids are always apt to receive from the use of mercury.

XI. *The History and Cure of a dangerous Affection of the OEsophagus.*
 By N. MUNCKLEY, M. D. Fellow
 of the College of Physicians, and of
 the Royal Society.

Read at the COLLEGE, AUGUST 11, 1767.

A WOMAN, of about forty years of age, was some time since admitted, under my care, into Guy's Hospital. She complained of an inability of swallowing foods, even of the softest kind; and that whatever she attempted to swallow, after staying some time in the throat, was thrown up again, by, what appeared from her description to be, a kind of convulsive motion of the OEsophagus. She said this complaint had affected her, though in a smaller de-

gree, for some years; but that of late it had increased so much upon her, as to appear to threaten the entirely shutting up of the passage into the stomach; she now being able to swallow nothing but the thinnest and most watery liquors, and those in a very small quantity. She appeared to be much wasted; her voice was hoarse; and her breathing was very considerably disturbed. She could point to the part where the obstruction to the passage of the food into the stomach appeared to her to be; but there was no swelling to be perceived either by the sight or the touch.

THIS case is an instance of one of the most deplorable diseases to which the human body is subject. Its beginning is in general so slight, as to be scarce thought worth notice; the patients perceiving only a small impediment to the swallowing of solid food;

food: they usually continue in this state for many months, during which time all liquid foods, and even solids themselves, when cut small, and swallowed leisurely, are got down without much difficulty: by degrees the evil increases, and the passage through the Œsophagus becomes so narrow, that not the smallest solid whatever can pass through it, but, after having been detained for some time at the part where the obstacle is formed, is returned again with a hollow noise of a very peculiar kind, and with the appearance of convulsion, as mentioned in the case above-recited. The seat of this malady is sometimes near the top of the Œsophagus, and at other times farther down, nearer the superior orifice of the stomach: in this last case the part of the alimentary tube, which is above the obstruction, is frequently so dilated by the food, which is de-

tained in it, as to be capable of containing a large quantity; and the kind of vomiting, by which it is again returned through the mouth, comes on sooner or later after the attempt to swallow, in proportion to the nearness or remoteness of the part affected. In the last stage of this disease, not even liquids themselves can be swallowed, so as to pass into the stomach; and the patient dies literally starved to death.

ON the dissection of such as have died in this manner, the Œsophagus is found to be considerably thickened; and in some so contracted within at the diseased part, as scarcely to admit the passing of a common probe; in others to adhere together, in such a manner as entirely to close up the passage, and not to be separated without great difficulty.

I AM now to lay before you what I have found to be the most efficacious

ous method of treating this disease, which, though not very uncommon, yet in general has been considered as incurable. And indeed the hope that some service may possibly arise from making known what my experience has confirmed to me on this head, is the principal motive which has induced me to trouble you with this paper. I say, what my experience has confirmed to me; for I would by no means be understood to claim the merit of having discovered the method of cure, which I am about to relate; and which took its rise from the following accident. A physician of great eminence in this city was, many years ago, called to a young lady, whom he found labouring under this disease: from the great degree of hoarseness which accompanied it, and from some other appearances, he was induced to think that there was a strumous affection of the glands of
the

the * throat; and for that reason, he ordered the neck to be slightly rubbed with a mercurial ointment; and a mercurial cerate to be laid over it. This, without his intending it, produced a salivation, which proved a perfect cure of the disease. Encouraged by this, he tried the same method with success, in other cases of a similar kind: and having, some time after, favoured me with an account of the success of this treatment, not concealing at the same time the cases in which it had failed, it induced me to follow the same method, by which I have reason to think many have been restored to perfect health, who would otherwise

* The use of mercury in a strumous affection of the Oesophagus, and of the parts adjacent, has been long known (vide Ruyschii adversar. anat. med. chirurg. dec. i. observat, 10.) but that disease differs widely from this which is the subject of the present paper; particularly in regard to that which may be considered as a pathognomonic symptom, the returning of the food, in the
have

have perished miserably. The only medicine then, from the use of which I have ever found any service in this complaint, is mercury; and in cases which are recent, and where the symptoms have not risen to any great height, small doses of mercury, given every night, and prevented by purgative medicines from affecting the mouth, have accomplished the cure; but, where the complaint has been of long standing, and the symptom has

manner already described, some time after an attempt to swallow. It may not be improper to add farther, that this is a much more partial affection than the other; the thickening frequently occupying no very considerable part of the *Œsophagus*; whereas in the former, not only the glands which are within, but those also which are external to the canal, are affected; and it is in great measure by the compression of these last mentioned glands, that the passage through the *Œsophagus* is closed. See the case recited in the 44th chapter of the first book of Tulpus's Medical Observations.

I have more than once seen the case which is the subject of this paper, complicated with swellings of the thyroid and other glands of the neck.

come

come on of the food's being returned through the mouth, in the manner above described; a more powerful method of treatment becomes necessary: in this case, I have never found any thing of the least avail in removing any of the symptoms, but mercury used in such a manner as to raise a gentle, but constant spitting: and this method I have pursued with the happiest success. Among the several unhappy persons labouring under this complaint, who have come under my care; I have found some whose constitutions were so much impaired, from the want of sustenance, that they were alike unable to bear their remedy and their disease; and notwithstanding all the methods used to support them, by the means of nourishing clysters, and every other way that could be thought of, and which their cases would admit, they have perished without

without, as far as I could judge, there being the least possibility of giving them relief. But, before the complaint has gained so much upon the constitution, the case is not to be despaired of; and of those who have come under my care in this state, by much the greater part have received considerable benefit from the method above-mentioned; and some have been entirely cured by it. I selected the case with which I began this paper, as an instance of the disease being advanced to as great an height as, I should presume, it could arrive at, without rendering all attempts towards a cure fruitless. I wish a like fortunate event to that which happened in this case, could with certainty be expected in all, in the same degree of this disorder: this patient was continued in a gentle spitting for near six weeks, during which time all her symptoms gradually

ally disappeared, and at the end of it she went out of the hospital perfectly cured.

I HAVE only to add, that my intention in communicating this paper, being to give an account of such things only in the history and cure of this disease, as have fallen within my own observation, I have purposefully avoided the mentioning of what has been written by different authors upon it. The complaint itself is, as has been already observed, not very uncommon; but there is no instance, to my knowledge, recorded, of success from any other manner of treating it, than that which has now been recommended.

XII. *An Inquiry concerning the cause of the Endemial Colic of Devonshire.* By GEORGE BAKER, M. D. Fellow of the College of Physicians, and of the Royal Society, and Physician to Her Majesty's Household.

Read at the COLLEGE, JUNE 29, 1767.

A VERY small acquaintance with the writings of physicians is sufficient to convince us, that much labour and ingenuity have been most unprofitably bestowed on the investigation of remote and obscure causes; while those, which are immediate and obvious, and which must necessarily be admitted, as soon as discovered, have been too frequently overlooked and disregarded. Such a spirit of refinement in theory has, in several instances, been the parent of

of dangerous errors in practice: men are apt to be as partial to their own conceits, as to their own offspring: and those opinions seldom fail to govern at the bed-side, which have been the result of much contemplation in the closet. It is with true pleasure I acknowledge, that this spirit is a fault, not so much to be imputed to the present, as to the last age. We have now learned not to indulge ourselves in visionary speculations, but to attend closely to nature. We observe diseases in themselves; and trace the powers of medicines in their effects on the human body; and experiment is the great *basis* of our reasoning. In many cases indeed, from our very limited knowledge, we are still obliged to allow, in some degree, the doctrine of the empiric sect, *non interesse quid morbum faciat, sed quid tollat*; yet are we far from being such empirics, in
the

the modern sense of the word, as to pay no regard to those causes, which are manifest and within our reach; such causes more especially, as lead us directly either to the cure of diseases, or, what is more desirable, to the prevention of them.

OF this last kind is that cause, to which, I apprehend, the provincial disease is owing, which is the subject of the present inquiry. And, if I am not mistaken in my notion, the maxim will hold good in this instance, and in an higher sense than is usually intended by it, that *cognitio causæ morbum tollet*. Reform but the mischievous practice, which occasions the disorder, and it will cease of course: it will be no longer endemial, and peculiar almost in one part of England; and in other parts, perhaps, by the same means, be less frequent than it is. But I flatter myself, I shall be doing an especial

service to the inhabitants of my native county, if, by giving them notice of a mischief, of which they are not aware, I may induce them to avoid it, and may at once promote the health and prosperity of my countrymen.

THE earliest account of the Devonshire colic, which I have met with, is in Dr. William Musgrave's *dissertatio de arthritide symptomatica*, published in the year 1703. In the fifth section of the tenth chapter *de arthritide ex colica*, is the following passage:

“ Alia vero colica, apud Damnoni-
 “ um, ex pomaceo immiti et acido,
 “ nimis usurpato, derivatur; id quod
 “ ex eo liquet, siquidem illos solum
 “ infestat, qui potioni isti assuevere,
 “ eademque ratione qua sunt assueti:
 “ sic ut iis tempestatibus, quæ po-
 “ maceo abundant, crescat, et in
 “ vulgus ea grassetur; contra vero,
 “ Pomona copiam negante, rarius
 “ observetur.”

It

It seems here very particular, that Dr. Musgrave should say so much of this colic, which he represents to be the effect of crude and sharp cyder; and make no mention of those essential and pathognomonic symptoms, by which it is at this time distinguished. Are we to suppose that, when Dr. Musgrave lived, it had not been observed to terminate in palsy, or epilepsy? That he was well acquainted with a disease exactly similar to this, namely the colic of Poytton, is very certain; for in the fourth history of the same tenth chapter, he mentions the case of a gentleman, who “*ætatis flore, colica, quam pictonicam appellant, aliquandiu vexatus, ex more et progressu istius mali ordinario, incidit in paralyfin; artus exinde marcidos, graciles, ἀκινήτους habens; per reliquum vitæ clinicus. Paralysi sub ejus initium accesserunt*”

N 2

“*dolores*”

“ dolores erratici, incerti, horum, il-
 “ lorum artuum internodia cruci-
 “ antes, autumno, et tempestate plu-
 “ via maximopere sævientes, et ad
 “ amiffim rheumatifmum fimulan-
 “ tes.”

It is indeed possible that Dr. Musgrave might not often have seen the colic, in its extreme ill effects, which he mentions as peculiar to the drinkers of cyder; for, as I am informed, orchards were not in those days much cultivated in the country near Exeter, where Dr. Musgrave resided; and there was no county-hospital as yet established. Dr. Huxham also testifies in the year 1739, that there was then ten times more cyder made and drunk in the county, than there had been about thirty or forty years before.

BUT whatever is deficient in Dr. Musgrave, is abundantly supplied by Dr. Huxham. His *opusculum de morbo*

morbo colico Damnoniorum, which he first published in the year above-mentioned, contains a very full description of this malady. He informs us, that, “ in the beginning
 “ of the autumn 1724, a season particularly remarkable for an abundance of apples, it spread itself
 “ over all the county of Devon,
 “ among the populace especially, and
 “ those who were not very elegant
 “ and careful in their diet; and
 “ that, though it may not rage with
 “ the same degree of violence, and
 “ may affect a much less number of
 “ people, yet it infests that county
 “ more or less every autumn.”

It does not appear, that this author began to make observations on the air and epidemic diseases, until the year 1728, that is, four years after the time of the remarkable epidemic colic of Devonshire. We ought, therefore, the less to wonder,

why we have received from him no determinate and uniform evidence, whether or not the air had any influence on this disease. In the tenth page of his treatise, we are informed, that “it was *most* violent when northerly winds prevailed;” whereas, in the twelfth page of the same treatise, we find, that “it was *equally* violent in dry and moist weather; “during the prevalency of a south “or a north wind.”—And immediately afterwards, “indeed in a dry “and cold season, sharp and northerly winds blowing, the griping pains “were observed to be *most* vehement.”

ANY intelligent reader, who shall peruse Dr. Huxham's description, will readily determine the *morbus colicus Damnoniorum* to be precisely the same disease, which, in the year 1617, was described by Francis Citois, a native of Poitiers, afterwards physician

physician to the king of France, and to the cardinal Duke de Richlieu, under the title of *novus et popularis apud Pictones dolor colicus biliosus*. Indeed it seems to be acknowledged by Dr. Huxham himself, that what is called *colica Pictorum*, “which kind of malady,” he says, “is very common in the West-Indies,” is similar to the disease which he describes; “arising from a similar cause, to wit, too great an use of the very acid juice of lemons, and requiring much the same method of cure.”

Dr. Huxham refers the cause of the Devonshire colic principally to a very gross, essential acid salt, or tartar, with which the * expressed

* There was such an abundance of apples in the year 1724, that vast quantities of them were thrown to the hogs: “But the swine-hogs, as well as the swine-men, suffered from the gluttonous abuse of the apples; and all of them wasted greatly in their flesh, and many died.” *Treatise on the Devonshire colic*, page 13. Whe-

juice of apples, whilst unfermented, abounds. He thinks that “ by long
“ and frequent drinking a liquor of
“ this kind, such a quantity of
“ crude, gross tartar is thrown into
“ the blood, that it thence becomes
“ very acrid; and not only the blood,
“ but, from that impure source, all
“ the humours thence secreted. So
“ that, instead of a very soft, lubri-
“ cating *mucus* separated by the
“ glands, discovered by Dr. Havers,
“ we have as it were a sharp, coagu-
“ lated matter, whence arises a great
“ pain in the joints, and impotence
“ of their motion.—Instead of an

ther or not the swine-hogs, who thus suffered by *the apple diet*, were affected with the colic of Devonshire, we have no information. If they really were thus affected, such an observation would greatly help to establish Dr. Huxham's opinion with respect to the cause of this disease. That it is not confined to the human species, is very certain; for it is well known that dogs and cats, those especially who live in the houses of painters, are particularly subject to it.

“ exceeding

“ exceeding soft lymph to moisten
“ the nerves, a corrosive ichor ; and
“ hence epileptical attacks. More-
“ over, the blood being saturate with
“ such a great quantity of salts, they
“ attract one the other strongly, and
“ form greater *moleculæ* than can
“ pass through the lymphatic ar-
“ teries, scarce indeed through the
“ sanguineous capillaries; hence va-
“ rious obstructions, and great irri-
“ tation on the nervous extremities.
“ At length even the very bile, that
“ variously-useful balsam of the body,
“ becomes corrupted and quite ener-
“ vated by the super-abundant apple-
“ acid, though in its natural state it
“ was designed to correct acidity.
“ The power of the bile being thus
“ destroyed, and being turned al-
“ most into a *coagulum*, it stagnates
“ in the gall-bladder, and hepatic
“ ducts. But, being exposed to the
“ heat of the body, and agitated by
“ the

“ the motion of the circumjacent
“ parts, it is again dissolved, and
“ grows daily more and more thin
“ and acrid. The acid salt added,
“ though it might otherwise, in some
“ measure, temperate the alkaline
“ acrimony of the bile, yet, being
“ continually agitated by the heat
“ and vital actions of the body, at
“ length even increases the acrimony.
“ In this dissolved state, the bile,
“ whether green or black, is either
“ resorbed into the blood, or thrown
“ into the intestines. When mixed
“ with the blood, it occasions pains,
“ anxieties, and spasms: besides, it
“ corrodes the tender vessels, and is
“ greatly injurious to the brain.
“ When it passes into the guts, it
“ occasions vomiting and colic *.”

* Much is said by Dr. Huxham concerning the origin of the black and porraceous bile: upon a presumption, that the acid, which he supposes to be predominant in the blood of cyder-drinkers,

THIS is a short specimen of Dr. Huxham's doctrine, extracted from a translation of his treatise, which was published with his own approbation. For the remainder of his very ingenious theory I shall refer you to the treatise itself; observing only, that you will there find a sentiment, which is not more true in general, than it is justly applicable on the present occasion—"Sine experientia
 "vana omnis theoria, bella fit ut-
 "cunque."

has a power of making those changes in the bile, even when first secreted. That acids, in the first passages, will make the bile porraceous, is very certain: but when *those who are conversant in anatomical dissections have found black and porraceous bile in the gall-bladder and biliary ducts*, they have not always agreed with Dr. Huxham in their conclusion; for I could bring several authorities to shew, that such changes in the colour of the bile, in the gall-bladder and ducts, has been referred to a putrid cause; nay, that by some they have been supposed constantly to attend the plague and pestilential fevers; in which cases acidity has not generally been suspected.

FOR

FOR although I always pay that deference, which is due, to the authority of this celebrated physician, I have for some time conceived doubts concerning the solidity of his doctrine. When I consider, that this colic of Devonshire is precisely the same disease, which is the specific effect of all saturnine preparations; and that there is not the least analogy between the juice of apples, and the poison of lead; it seems not to me probable that two causes, bearing so little relation to one another, should make such similar impressions on the human body.

BUT, lead itself being certainly of such a nature, as to be abundantly answerable for all the ill effects, complained of from the cyder, my thoughts were naturally carried to the search of it; and well might I expect to find it, in some way or other, combined with that liquor.

No

No author, whom I have had an opportunity of consulting, has given any intimation of having conceived the same suspicion with myself, except only the anonymous author of *examen d'un livre qui a pour titre T. Tronchin de colica Pictorum* *. This writer indeed hints in a cursory manner, "Il est possible, que les vins, dont
 " parle Citois, et les cidres, dont parle
 " M. Huxham, aient été, sans qu'ils
 " laient pu découvrir, altérés avec
 " la litharge, ou quelque autre ma-
 " tiere semblable." It is evident, however, from what he afterwards says, in the forty-sixth page, that he was very far from having formed any settled opinion on this subject.

* In consequence of this vague intimation, contradicted by himself, the author of this pamphlet has lately claimed the merit of having been the first, who conjectured, that the colic of Poitou is produced by one simple cause only. In the second volume of *the medical transactions*, page 433, the reader will find this claim stated, and the reasonableness of it considered.

*Ces trois causes, ſcavoir la bile, les
“ matières minérales venimeuſes, et
“ les vins verds et auſtères, quoique
“ différentes en apparence, pro-
“ duisent, malgré ce qu’ en peut dire
“ M. Tronchin, des coliques à peu
“ près de même eſpèce.”*

BUT to return to Dr. Huxham.
In endeavouring to explain the nature of the apple-juice, he is led to a comparison of our cyder with the rhenish and moselle wines; which, he informs us, agree in containing an abundance of crude tartareous salt. And he adds, “ their native salts
“ seem very near alike; and, ex-
“ amined by the microscope, appear
“ exactly of the same figure.” But how much soever our cyder may agree with rhenish and moselle wines in the particular circumstance of containing a large quantity of essential salt, of a similar figure; no argument, from analogy, will here be valid, unless it can be shewn also,
that

that rhenish and moselle wines have ever produced the colic of Poitou, in an unadulterated state. It is indeed certain, that this disease has been common in the countries where those wines are much drunk; but it is as certain that the merchants have long practised the art of adulterating them with litharge. I have frequently found in these wines evident marks of a saturnine impregnation.

BUT, if pure cyder be the cause of this disease, as being an acid, I must here take leave to ask a few questions, which I am at a loss to answer on that principle. Why then is the colic of Poitou very little known in the eastern countries, where the Turks, whose religion obliges them to abstain from wine, drink every day large quantities of a very acid sherbet? Does the experience of jockeys, who, in order to reduce themselves to a certain standard of weight by sweating, are said to drink largely of vinegar,

negar, strengthen such an observation? Do we find it to be true, that children, and valetudinary people, and particularly chlorotic girls, whose first passages abound with acid, are on that account subject to this species of colic? Is not a *diarrhœa* or *cholera*, the ordinary effect of the *immoderate and very long use of the summer and autumnal fruits*? And is it not a common observation, that Must relaxes and liquefies, and, if drunk largely, is apt to produce dangerous fluxes? Does not the passage of Hippocrates, cited by Dr. Huxham, testify, that γλεῦκος ὑπάγει ἢ διαχωρεῖ? What reason can be given, why the poorer inhabitants of the counties of Worcester, Gloucester, and Hereford, who use, as their common drink, a weak acid cyder, are subject to no such colic? Is it sufficient to reply, that, in Devonshire, the apples do not ripen, among other reasons, because the trees are planted too near
to

to each other; but that, in Herefordshire, and in the neighbouring counties, the trees being more judiciously planted, the fruit is brought to more maturity? Or, that, in the counties last mentioned, the apples are kept till they are rotten, by which means the acid is subdued, and becomes innocent? Is it rational to have recourse to *the moisture, exhaled from the vast atlantic ocean*, in order to shew, why the air of Devonshire is unwholesome, and the apples sour? Is it not proved by the experience of the inhabitants of Scotland, that very large quantities of a small beer may be drunk, even in the act of fermentation, without producing an epidemic colic? Why is this disease no longer endemic in the province of Poitou? Is it that the grapes are brought to more maturity, than they were formerly? Has the Sun more power now, than in the time of Citois?

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Is it reasonably to be suspected, that the essential salt of a vinous liquor can raise such tumults in the bowels, whether by corrupting the bile, or otherwise; when it is vulgarly known, even among the workers of the lead-mines in Derbyshire, that patients, afflicted with this same disease, do not receive a more immediate, or a more effectual relief from any medicine whatever, than by taking large and repeated doses of this very essential salt, the *cremor tartari*; and when it appears that Dr. Hillary greatly depended on it, for the cure of the dry-belly-ach, in the West-Indies? And lastly, can we possibly allow, that a cause, *similar in its nature to the acid of lemons*, is productive of this disease in our own country; after having been informed both from the West Indies, and the colonies of North America, that the juice of lemons and limes is not only much trusted to for its cure, but that it is even

even esteemed to be a preservative from it?

ZELLER, in his *docimasia, signa, causæ, et noxa vini lithargyræo manganisati*, gives an account of the revival of the adulteration of wine by litharge in the duchy of Wirtemberg, in the beginning of the present century. In this dissertation he asserts, that though the wines, in the neighbourhood of Tübingen, were as acid as vinegar, the inhabitants had long drunk them with impunity, till this fraud was introduced. “ Constat
 “ viciniam nostram, ubi alias montes
 “ lacrymantur acetum, et istiusmodi
 “ vina immatura et acida per plures
 “ annos, imo lustra, ab incolis et militibus largiter hausta fuerunt, ab
 “ omnibus tamen his symptomatibus
 “ penitus liberam fuisse, cum a fūco
 “ quoque libera fuerit: imo in ipsa
 “ hac nostra civitate, quæ ante duo
 “ lustra truculentia hac tantum non
 “ oppressa fuit, postquam fraudem
 O 2 “ hanc

“ hanc plurimi, tam vietores, quam
“ caupones, tecte quidem exercu-
“ erunt, omnes isti, qui a cauponi-
“ bus vinum vel non emerunt, vel in
“ eorum ædibus non biberunt, a tor-
“ minibus et cruciatibus hisce immu-
“ nes evaserunt; licet eorum domes-
“ tici per aliquot annos austerum et
“ acidissimum hauserint vinum, ut
“ acidius gustari vel dari nequeat;
“ aliis interea, quos dulcedo inescavi-
“ vit, miserrime patientibus, aut en-
“ ervatis, elumbibus redditis, pen-
“ dulis artubus et resolutis inceden-
“ tibus, aut neci traditis; plurimi
“ enim miserrime perierunt.”

THERE is indeed an experiment, mentioned by Zeller; but it seems to prove nothing against the general wholesomeness of acids. Upon his having given to a dog three ounces and an half of very strong vinegar, the respiration of the animal immediately became sonorous and difficult; and he died in the third hour after
he

he had swallowed the vinegar, having thrown up great quantities of froth, which at last was mixed with blood. The dog being opened, no signs of inflammation appeared in the stomach: the mischief is described to have been in the lungs only. Some of the vinegar probably found its way into the lungs; and suffocation seems to have commenced in the very act of swallowing. Whereas Brunnerus, (*Ephemerid. Germanic. an. 4. observat. 92.*) who killed a dog with an ounce of powder of litharge, boiled in vinegar, found the effects of that poison to be principally in the stomach, intestines, urinary bladder, and the other *viscera* of the *abdomen*.

I SHALL only add one more observation concerning acids. Physicians, who have resided some time in the hotter countries, have testified, that there are no better remedies against spasms, dysenteries, and the other endemial diseases in those climates, than

the acid vegetables, with which nature has most liberally supplied them. This opinion is expressed in a strong manner by Jacobus Bontius in his *historia naturalis indiciæ orientalis*, lib. vi. cap. 27. "Videtur Natura vo-
" luisse ex professo multas acidas et
" constringentes herbas e terra pro-
" ducere, contra violentos et ende-
" mios morbos, dysenteriam nempe,
" choleram, et spasmodum, plerumque
" a bile ortos : ut quasi digito mon-
" straret, ubi hæc vel similia mala
" nascuntur, ibi locorum remedio-
" rum manifesta et etiam occulta
" qualitate pugnantium penuriam
" non fore."

It seems therefore, upon the whole, not to have been without sufficient foundation, that I had for some time suspected, that the cause of this colic was not to be sought for in the mere acid cyder; but in some adventitious, either fraudulent, or accidental, adulteration with lead.

“tis, ac pedibus non suis, sed cru-
 “rum musculis, ad ridiculum, ni-
 “miserandum, incessum compositis,
 “voce clangosa et strepera.”

I LATELY received from Dr. Andrew of Exeter the following account of all the patients, under this disease, received into the Devon and Exeter hospital since September 1762.

From Sept. 1762 to Sept. 1763	—	72
Sept. 1763 to — 1764	—	75
Sept. 1764 to Lady-Day 1766	—	86
Lady-Day 1766 to July 6, 1767	—	52
		285

Of this number 209 were cured.

Dr. Andrew likewise instructs me, that patients are brought to the Devon and Exeter hospital from all parts of the county; but chiefly from those parts, where most cyder is made—That the most violent symptoms of this disorder, such as
 pain

pain and costiveness, are generally removed before the sick are brought to the hospital; and that nothing commonly remains but a paralytic weakness in the arms. He adds, "I have known this complaint cured radically; though, I confess, a return often happens. When the disease proves obstinate, we always endeavour to get our patients into the hospital at Bath; the Bath-water, though not a specific, being esteemed by us the most effectual remedy, both internally and externally used."

UPON farther inquiry, I find that eighty patients, under the effects of the Devonshire colic, were received into the Bath-hospital in the course of the last year; forty of whom are said to have been cured, and thirty-six sent away greatly relieved. I am assured likewise from that hospital, that the proportion of such patients sent from Devonshire, to those from
the

the counties of Hereford, Gloucester, and Worcester, is generally as eight to one.

IN some letters, which I have lately received from Dr. Wall, of Worcester, the following facts are asserted:

“ The counties of Hereford, Gloucester, and Worcester, are not, so far as I know, subject to the colic of Poitou, or any other endemic illness, unless it may be the rheumatism; which, I think, the inhabitants of Herefordshire are more liable to, than those of some other counties. There is no lead, which can give occasion to that colic, used in any part of the *apparatus* for grinding or pressing the apples, or fermenting the liquor. Once indeed, in a plentiful year of apples, I knew a farmer, who, wanting casks, filled a large leaden cistern with new cyder, and kept it there, till he could procure hogheads sufficient to contain the liquor.

“ liquor. The consequence was, that
 “ all, who drank of it, were affected
 “ by it as lead workers usually are.
 “ We had eleven of them, at one
 “ time, in our infirmary.

“ I have lately had two or three
 “ patients in that distemper, occa-
 “ sioned by their having drunk cy-
 “ der made in a press covered over
 “ with lead. But this fact of a cy-
 “ der-press covered with lead, is a
 “ singular, and perhaps the only in-
 “ stance of the kind in this part of
 “ England. It happened in a part of
 “ the county of Worcester, adjoining
 “ to Warwickshire, where very few
 “ apples grow; and the bed of the
 “ press being therefore cracked by
 “ disuse, the sagacity of the farmer
 “ contrived this covering, to prevent
 “ a loss of his liquor. In general,
 “ the cyder-drinkers with us are
 “ healthy and robust; but for the
 “ most part lean. The liquor is clear,
 “ and passes off readily by urine
 “ and

“ and perspiration; which enables the
“ common people to drink immense
“ quantities of it when at labour, to
“ the amount of several gallons in a
“ day. I have heard it observed by
“ a physician, late of this place, who
“ was much employed in the cure of
“ lunatics, that more of those un-
“ happy persons came to him from
“ Herefordshire, than any other
“ place. The fact, if true, may pos-
“ sibly arise from the quantity drunk,
“ rather than the quality.”

WERE the *aparatus* for making cyder the same in all the cyder-counties, it would appear, at first sight, very unaccountable, that the inhabitants of one county in particular, should experience such terrible effects from the use of this liquor, while those of the others drink it with impunity. But if we examine the several methods of making cyder in the different parts of the kingdom, and the utensils employed in it, we shall

shall be able to conclude, with a strong degree of probability, what, at least in part, occasions such a remarkable difference.

DR. Wall informs me, that in some parts of the counties of Hereford, Gloucester, and Worcester, the mills, in which the apples are ground, being sixteen, eighteen, or twenty feet in diameter, consist of several pieces of stone or timber, joined together by means of iron cramps, fastened with lead: but, that these cramps are fixed only in the *bed* of the mill, or on the outside of the curb; and not in the groove, where the apples are ground. The same gentleman, however, observes, that, if many apples, full of juice, are suffered to lie long on the bed of the mill (where they are usually placed in an heap, in readiness for the groove) some of which may perhaps be rotten, others bruised in the gathering, and a moisture spread over the whole, from
the

the fermentation and sweating of the fruit, it may perhaps be doubted, whether some parts of the lead, used in the cramps, may not be dissolved; though it must be, at most, in a quantity extremely small; there being but very little lead used in the junctures; and the surface, exposed to the fruit, being almost imperceptible. But I am informed by another person, that, in many parts of Herefordshire, and the neighbouring counties, the stones, composing the mills, are joined together with a putty; which putty is no other than a mixture of oil and whiting; and that neither iron nor lead are originally used in the construction of them. However, if any of the joints, in wearing, happen to start, it is admitted, that they are repaired with iron cramps, fastened with lead.

In many parts of the county of Devon, the circular trough, used in grinding the apples, is composed of several

several pieces of moor-stone, cramped together with iron, and fixed by melted lead, poured into the interstices, on the inside of the groove. These stones are not always wrought with much art; and sometimes, being of irregular and unequal figures, they do not correspond with each other; so that considerable chasms are left between them; and these chasms are filled up with lead. The apples therefore, ground by the pressure of the roller, come immediately into contact with no small quantity of this poisonous mineral. I have heard only of one trough, which is made of a single stone.

It is likewise common, in several parts of the county, either to line the cyder-presses entirely with lead, in order to prevent their leaking; or to make a border quite round the press for receiving the juice of the apples, and conveying it into a vessel,
of

of wood or stone, placed underneath. In many other places, it is common to nail sheet-lead over any cracks or joints in the presses; and likewise to convey the juice from the presses in leaden pipes.

WHEN I first entered upon this enquiry, I was of opinion that whatever mixture of saturnine parts there might be found in the cyder of Devon, it was wholly to be referred to the accidental use of that metal in the troughs and presses. I had indeed been informed, that it is the practice of some farmers, in managing their weak cyder, made early in the year, before the apples are ripe, to put a leaden weight into the cask, in order to prevent the liquor from being sour; and that this cyder is the common drink of their servants and labourers. But I was willing to believe, that such a pernicious method of adulteration (a crime, which
I both

both in France and Germany is punished by death) was not often practised by our countrymen. 'That it is not practised with any consciousness of the mischief of it, I still hope and believe. But it is certainly common, with dealers in cyder, when the liquor frets too much, and is thereby in danger of becoming acetous, to rack it into a leaden cistern *. And I have good authority to add, that even the use of cerusse, in correcting acidity, is well known by the farmers and merchants.

I WAS in hopes, that a custom, to which Mr. Philips alludes in his excellent Georgic, had subsisted only in the imagination of the poet :

—“ nor let the crude humors dance
 “ In heated brasts, steaming with fire intense ;
 “ Although Devonian much commend the use
 “ Of strengthening Vulcan.”

* I have lately been informed that this method is likewise practised in Herefordshire.

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P

BUT

BUT I have received very positive information, that it is a common practice in Devon, to boil the juice of the apple before fermentation; with a view to increase the strength of the cyder, and to prevent its advancing to the acetous state. This custom seems to have been first introduced, in imitation of the management of wine in some countries; where, we are informed, it is usual to boil the unfermented liquor with the same intention *. According to the testimony of Neuumann, the strong, full-bodied, rich, sweet wines, such as the malmsey, canary, and some of the Spanish and Hungarian wines, are generally a mixture of fermented and

* This method of managing wine appears to have been very antient. We meet with several allusions to it in Virgil :

“ Aut dulcis musti Volcano decoquit humorem,
“ Et foliis undam trepidi despumat aheni.”

Georg. lib. i. ver. 295.

And in Georg. lib. iv. ver. 269.

—“ Igni pinguia multo

“ Defruta.”—

Columella is copious on this subject.

inspissated

inspissated Must; the latter being added to increase the richness of the liquor, and prevent the fermentation from running beyond its due limits. And we are informed by the same author, that several of the Italian wines, called by the general name of *vini cotti*, by means of decoction, continue fit for drinking a year or two, although they have suffered scarcely any degree of fermentation, and are little more than boiled Must. This process is only applied to thin watery juices, extremely prone to ferment, and which fermentation, when once begun, can scarcely be suppressed, till it has run beyond the vinous state.

HOFFMAN accounts for the strength and sweetness of many of the wines of Italy, in the following manner.

“ Dependet dulcedinis, nec non viri-
 “ um causa potissimum ex eo, quod
 “ in more habeant vel ex uvis matu-
 “ ris selectis in aëre parumper exsic-

“catis ea præparare, vel ipsa recentia
“musta igne leni aquositate in auras
“emissa inspissare, et tunc fermenta-
“tioni exponere. Hoc artificio vina
“majorem acquirunt dulcedinem,
“quandoquidem, mustum quo dul-
“cius et spissius est, eo minus vehe-
“mentem subit ebullitionem, quæ
“alias plerumque aciditatis nimiae
“genitrix est.” (*De præstantibus Eu-
ropæ vinis, cap. i. art. xi.*)

It will very easily appear, how this method of boiling the Devonshire Must does necessarily expose it to an impregnation of lead. It is customary in almost every country, to make the upper parts of the boiling vessels of lead; as the capacity of the vessel may be thus increased, at a less expence, in the part where it is not exposed to the fire. In the state therefore of ebullition, the mere vapor of the acid Must, although the liquor be not supposed to reach up to the
lead,

lead, will certainly dissolve the metal; and, in the state of sugar of lead, it will trickle down the sides of the vessel, and be united with the boiling juice. Here then we discover an additional reason, why the liquor, heated in this manner, should have its fermentative quality restrained, and should acquire an artificial sweetness. It is well known, that, a few years ago, this very practice produced *the Devonshire colic* in the county of Kent. Some cyder, which had been made in a gentleman's family, being thought too sour, was boiled with honey in a brewing-vessel, capped with lead. All, who drank this liquor, were seized with this disease; some more, others less violently. One of the servants died very soon in convulsions; several others were cruelly tortured a long time. The master of the family in particular, notwithstanding all the assistance which art could give him, never recovered his health;

but died miserably, after having, almost three years, languished under a most tedious and incurable malady.

THERE is at this time, or at least there very lately was, on an estate belonging to His Grace the Duke of Somerset, in the parish of Bury Pomeroy, a leaden cistern of very large capacity. During many years, as I am credibly informed, the juice of the apple, as soon as expressed, was conveyed to this cistern, and remained in it, until it was fit to be removed into casks. At last it was discovered, that this was a most pernicious practice; for that those, who drank the cyder, thus prepared, were most cruelly tormented by the Devonshire colic; and that many died. The leaden cistern therefore was no longer used; and, in consequence, the disease became less frequent among the inhabitants of Bury Pomeroy.

IHAVE frankly been informed by a gentleman of the county of Devon, that

that it has been a custom, long practised in his own family, to restrain the fermentation of cyder, by throwing into it a certain quantity of sugar of lead; but he is by no means convinced, that any ill consequences ever followed this practice; and he insists, that his family are not more subject to the colic, than their neighbours.

It is very certain, that, in various parts of the county of Devon, there are those, who possess certain secrets for the management of cyder; the general object of which secrets is, to correct the sourness and austerity of that liquor. Indeed, there is great reason to fear, that pernicious methods of adulterating vinous liquors are too well known, and too much practised in every part of this kingdom. I have several times discovered marks of a solution of lead in the English *made* wines. In a small *compendium* of housewifry, intituled, *The art of*
P 4 *making*

making wines, from fruits, flowers, and herbs, all the native growth of Great Britain, by William Graham, late of Ware in Hertfordshire, under the article of *secrets belonging to the mystery of Vintners*, page 30, I have lately found the two following receipts.

“ To hinder wine from turning.

“ Put a pound of melted lead in
“ fair water into your cask, pretty
“ warm; and stop it close.

“ To soften green wine.

“ Put in a little vinegar, wherein
“ litharge has been well steeped, and
“ boil some honey to draw out the wax.
“ Strain it through a cloth and put a
“ quart of it into a tierce: and this
“ will mend it, in summer especially.”

THIS little book, having gone through six editions, may be supposed already to have done some mischief: and the editor of it would act humanely, if he would, in future editions,

editions, not only suppress the secrets of the mystery of Vintners, but shew how dangerous such receipts may be to the health of mankind.

I DETERMINED, therefore, to make use of the first opportunity, which might occur, of satisfying myself by experiment, whether or not there might be in fact any solution of lead discovered in the cyder of Devonshire. Happening to be, in the month of October 1766, at Exeter, I procured some of the expressed juice of apples, as it flowed from a cyder-press, lined with lead, in the parish of Alphington. On this I made and repeated several experiments, by means of the *atramentum sympatheticum*, or *liquor vini probatorius*; and of the volatile tincture of sulphur. The experiments satisfied me, that the Must did contain a solution of lead. The same experiments were made on some cyder, made in the parish of Alphington,

phington, of the preceding year. This likewise shewed evident signs of lead contained in it; but in less proportion than in the Must.

BUT, being unwilling to come to any decisive conclusion, solely on the authority of my own trials; more especially as I had been under the influence of a preconceived opinion; I brought with me to London some of the same Must, which I had examined at Exeter, in a vessel of stoneware. This Must, together with some Devonshire cyder of the preceding year, purchased of the maker (who assured me that he used no lead in any part of the *apparatus*, except only what was applied in composing the trough, as was mentioned above) were the subject of the five first experiments, which will hereafter be described. In making these, as well as several others, on the same subject, Dr. Saunders kindly gave me his assistance.

BEFORE

BEFORE that I give an account of the several experiments, which we made, it may be proper to make an observation or two, which will perfectly explain the mode of union, which takes place between wine or cyder, and lead.

The expressed juice of the ripe grape, or ripe apple, contains a considerable quantity of acid, united with a sugar. This acid having undergone the saccharine fermentation, the whole is gradually converted into an alcohol or inflammable spirit. But if the original juice, or Must, be crude and acid, without having much saccharine matter in it, the native acid is with difficulty assimilated; or, when it arrives at the proper period of assimilation, it does not remain there stationary, but hastens on to the acetous fermentation. When lead is added to such wines, or cyders, their acidity
is

is covered; a sweetness is communicated to them; and their progress to the acetous fermentation is checked.

THE richer wines, of which the original juice contains a large proportion of saccharine matter, are less liable to adulterations of this kind, than the poorer wines of northern climates, such as the rhenish and the moselle wines, and our English cyder.

It is farther to be observed, that the vegetable acid, either in its native state of Must, or in its fermented state of vinegar, or in its intermediate state of cyder, very readily receives an impregnation from lead, whether it be applied in form of metal, or of *calx*. We are therefore to consider lead, when united with wines, as in the condition of *saccharum Saturni*.

By attentively observing the variety of changes produced by certain bodies,

bodies, when added to a solution of *saccharum Saturni*; and by applying these observations to the wines, which are the most frequent subjects of this adulteration, Chemists have been enabled to detect such frauds, wherever they have existed. We now proceed to our experiments.

EXPERIMENT I.

A small quantity of Devonshire cyder being exposed upon clean paper to the fumes of the volatile tincture of sulphur, became immediately of a darkish colour. And we could only imitate this colour by exposing a dilute solution of *saccharum Saturni* to the same fumes. A small quantity of Herefordshire cyder, exposed in like manner to the same fumes, exhibited no such appearance, until a few drops of a solution of *saccharum Saturni* were added to it.

OBSER-

OBSERVATION I.

FROM this experiment we are to understand, that the acid, before united with the lead in the cyder, and the volatile alkali in the tincture of sulphur, mutually attracted each other; and that it was the precipitate of the lead, united with the sulphur, which produced the dark colour above-mentioned.

EXPERIMENT II.

A small quantity of *hepar sulphuris* (prepared by digesting together in a sand-heat one ounce of orpiment, and two ounces of quick-lime, with twelve ounces of water, in a close vessel) being added to some Devonshire cyder, in a few minutes occasioned a darkish colour in the body of the liquor; and the whole became very opaque. No such change was produced in the cyder of the
county

county of Hereford, until a few drops of a solution of *saccharum Saturni* were infused; when the same appearance likewise was perceived.

OBSERVATION II.

THE reasoning, made use of in the former observation, is applicable here. The decomposition of the *saccharum Saturni* and of the *hepar sulphuris* was effected by the same laws of elective attraction.

EXPERIMENT III.

To a small quantity of Devonshire cyder a few drops of *hepar sulphuris* (prepared by boiling equal parts of fixed vegetable alkali and sulphur together in water) were added; and a precipitation of a very dark colour was produced.

WHEN Herefordshire cyder was treated in the same manner, the pre-
 6 cipitate

precipitate produced was as white as milk; and it was only upon the addition of a few drops of a dilute solution of *saccharum Saturni*, that a precipitate of the same colour with the former could be obtained.

OBSERVATION III.

THERE is some nicety required in making this experiment. The *hepar sulphuris* is not to be added in any large quantity: for, as all the lead is precipitated, upon the first addition, it is easy to perceive the several successive shades of colour in the precipitate, until all the lead is separated; and then the precipitate, upon a farther addition of *hepar sulphuris*, assumes the whiteness of the precipitate obtained from the Herefordshire cyder, which intitles it to the appellation of *lac sulphuris*. If a large quantity of *hepar sulphuris* be at once added, the whiteness of the too copious precipitate

tate is such, as to render the dark colour of what is first precipitated imperceptible.

EXPERIMENT IV.

SOME Devonshire cyder was examined by means of the volatile tincture of sulphur, as in experiment III: and a very dark coloured precipitate was obtained. A similar precipitate could not be obtained from Herefordshire cyder, until a weak solution of *saccharum Saturni* had been added to it.

SOME of the Must (taken from the press in the parish of Alphington) treated in the same manner, produced precipitates of a deeper dark colour. This sufficiently shews, that the solution of lead in the Must, was stronger than that in the cyder.

IT is a matter of no consequence, whether the lead, the existence of which is proved, was applied to the

cyder in its state of Must, or in that of a vinous liquor. However, as the Must afforded more considerable signs of impregnation than the cyder, it should seem probable, that the lead was incorporated with the Must; and that, as the acid, during the fermentation, is in a great measure converted into alcohol, a proportional quantity of lead would necessarily be precipitated.

THE same experiments were afterwards tried on several other specimens of Devonshire and of Herefordshire cyder, from the cask as well as the bottle. The result of them was constantly and uniformly the same as has been described, except only in three or four instances. Three bottles of different kinds of the former shewed no signs of having been impregnated with lead; and one of the latter, which I very lately examined, gave a darkish precipitate.

It has been proposed by several authors, to detect such adulterations of wines

wines by means of the vitriolic, or of the muriatic acid; which, by uniting with the lead, will make it precipitate. But it is ascertained, by the experiments of Professor Gaubius, that trials made with the acids, are less conclusive than those which have been described.

EXPERIMENT V.

IN order to put the matter entirely out of doubt, an extract was made from 18 common quart bottles of Devonshire cyder, of the preceding year, (first strained through a linen cloth) which had been in my cellar more than three months, but had been only a fortnight in bottles. This extract, being assayed with the black flux, a quantity of lead, weighing four grains and an half, was found at the bottom of the crucible*.

* As a doubt has arisen concerning the validity of this fifth experiment, I shall lay before the reader every circumstance relating to it. Two

EXPERIMENT VI.

Two pounds of pearl-ashes were dissolved in water ; and the solution,

small granules of lead having been observed in a former extract, which was made from eighteen bottles of Devonshire cyder, it was immediately suspected, that these granules could be no other than *shot*, used for the purpose of cleaning bottles, and left in them by accident. This extract was therefore thrown away ; and the cyder, used in the fifth experiment, was strained through a cloth, in order to prevent a possibility of any *shot* being found in the extract. Dr. Saunders informed me that, in the cloth through which the liquor had passed, there were two or three such granules of lead. Therefore in order to determine, whether or no the cyder, which had been the subject of our experiments, owed its saturnine impregnation to this accidental cause, the tests were applied, in the manner before-mentioned, to some of the same cyder, taken from a bottle, which, we were sure, had not contained any *shot* : for the bottle was very carefully examined, after having been broken, in the presence of several gentlemen. The change of colour, on the application of the tests, was precisely the same, as in the former experiments.

However, in order to obviate all cavil, another experiment was made. The first part of this sixth experiment, namely, what relates to the precipi-
having

having been filtered, was added to three gallons of Devonshire cyder, drawn from a cask. The liquor became turbid, shewing marks of a precipitation. It was then filtered; and the filtering papers, together with the powder, which was left on them, was burnt in a brass mortar, and afterwards burnt in a crucible, being stirred with an iron spatula in order to promote the union of the particles. The contents of the crucible were then exposed on a sheet of clean paper, and were carefully examined. Some very small globules were here found; which, being melted in a clean crucible, were reduced into one mass, which was evidently malleable lead. The quantity was a little more than one grain.

tation and filtration, was performed intirely under the direction and management of Mr. Hewson. The latter part was performed by Dr. Saunders, in the presence of Mr. Hewson, and of Dr. Rulston.

IN order to determine, what proportion *saccharum Saturni* bears to lead, the following experiment was instituted.

FOUR ounces of *saccharum Saturni* being put into a retort, and a receiver being applied, there were distilled over about one ounce and an half of an oily acescent liquor. The remainder being exposed, with a small quantity of *phlogiston*, to a degree of heat, sufficient to melt lead, one ounce and seven drachms of malleable lead were obtained.

IN the latter end of the last century, when the physicians of Germany (particularly Vicarius, Cockelius, and Brunnerus, whose dissertations on this subject may be found in the *Ephemerides Germanicæ*) had taken great pains to discover the true cause of the epidemic colic, which, to use the language of Brunnerus, (*Dec. 3. an. 4. observat. 92.*) “non magis ægrotan-

“ ægrotantium viscera, quam medentium animos, torserat ;” and when they had at last demonstrated, that this disorder was wholly to be referred to small acid wines, adulterated with litharge, there appeared a certain writer, a physician of Copenhagen *, who endeavoured to exhibit a specimen of his reading and ingenuity, by maintaining a bold paradox. This man, in very pompous language, and with an air of the greatest confidence, asserted in his

* It is recorded of this physician, whose name was Seerup, that, although, in reality, a man of very moderate parts, and less learning, he, by means of a certain authoritative, over-bearing, dictatorial manner, both in his writings and common conversation, passed among many of his countrymen and some foreigners, as a person of the most extraordinary abilities, and a perfect oracle in physic: that, thus flattered, he grew old in error and in obstinacy; his vanity and self-importance never suffering him to abandon any opinion, which, through ignorance and inexperience, he had once adopted. It is no wonder, therefore, that the reputation of this man's writings did not long survive the author.

triumphus lithargyriatorum, that no danger was to be apprehended from wines in which litharge was dissolved; and that all the ill effects, supposed to have been derived from that cause, were really to be attributed to the austere acid of wine made of unripe grapes. This opinion he endeavoured to defend by the authority of Dra-witzius, Sennertus, Van Helmont, Theodorus Zwinger, Wepfer, Boyle, and several other writers. He likewise quoted many authors, to shew the salutary effects, produced in the human body by the internal use of lead; and insisted, in virtue of their testimony, that it had cured affections of the spleen, arising from an acid cause; the hypochondriacal disease; sudden inflammations; colics occasioned by the *bilis æruginosa*; obstinate quartan fevers; ulcerations of the lungs, as well as of other parts; and the plague itself. He brought other authorities

thorities to shew, that the *aqua Saturni* had been of very great use in disorders occasioned by worms; that the *spiritus Saturni* had cured the leprosy; that Paracelsus held it to be a specific remedy in madness; and that in the small-pox, and all other inflammations, it had been proved to be an efficacious medicine; that it was the great sudorific medicine of Faber; that it was Mynsicht's secret for the cure of the *phthisis*, and diseases of the spleen and colic; that the great success, which had attended the practice of Petrus Matthias, was to be ascribed to the use of *saccharum Saturni*, and other preparations of lead: and, lastly, that a constipation of the belly could not justly be attributed to *saccharum Saturni*; since Antonius de Heide asserts, in his medical observations, that he cured that disorder by administering to his patients five grains of it, mixed with crabs-eyes,

BUT

BUT it is presumed that, the presence of lead in the cyder of Devonshire being demonstrated, there is no one, at this time of day, likely to revive the argument of Seerup, and still to insist on the deleterious quality of the acid : for a poison is discovered, which is experimentally known to be adequate to all those dreadful effects so pathetically described by Dr. Huxham. It is likewise presumed, that no opinion, unsupported by facts, by experience, or analogy, (how respectable soever the character of its author may be) will be admitted in evidence, in contradiction to the authority of a fact, for which we have the decisive and indisputable testimony of our senses.

THE general character of lead, and of the preparations of lead, when given internally, has been, that they cool ; incrassate ; repel ; absorb, and obtund acrimony. And it is very well

well known, that their real power has, in many instances, seemed to answer to such a general character; for there are scarcely any medicines, which produce their effects more immediately, or with greater certainty, in colliquative sweats, in fluxes, and in hæmorrhages. But it is as well known, that the relief given, which, for the most part, is only temporary, has been frequently followed by violent pain in the bowels, obstinate costiveness, suppression of urine, tremors, spasms, palsy, asthma, and suffocation. And although, if we give credit to the testimony of credible writers, we must allow, that patients, of certain constitutions, may have taken these medicines with success, and with impunity; yet surely physicians cannot be too cautious in avoiding the use of medicines, the effect of which, for aught that they can presume to ascertain, may be more
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formidable than the very diseases to which they are opposed.

THAT preparations of lead were formerly very fashionable medicines, we may judge from the oldest dispensatories; in which we find an almost infinite number of magisteries, elixirs, and balsams, that have that metal for their *basis*. We are informed by Mr. de Haen, that the use of these medicines is much more common, even now, than is generally imagined. He thinks, that the number of patients, affected by the colic of Poitou, is immensely increased by such means. He mentions the *formula* of a medicine, compounded of one scruple of *saccharum Saturni*, one drachm of cerusse, and six ounces of water. By this medicine, taken *cochleatim*, a patient, he says, was cured of a *gonorrhœa*; but he was soon afterwards seized with the most excruciating pain in his bowels, followed by a vomit-
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ing of his excrements. He adds, that this man, though he escaped death, did, even so long as three years after, lament the reliques of that most dreadful cure. I could quote from my own experience more than one instance, in several respects similar to this which I have taken from Mr. de Haen's *ratio medendi*.

What then can we think of the practice of the Chinese, who very frequently administer internally various preparations of lead, to which they ascribe extraordinary virtues? The observation, made in this respect by Mr. Malouin, in his *chymie medicinale*, seems judicious. “ En réfléchissant
 “ sur l'usage interieur que les Chinois
 “ font du plomb, on est porté à croire
 “ que ces peuples sont différemment
 “ construits ou tempérés; ou que leur
 “ plomb differe du nôtre.”

Dr. Huxham finds it difficult to allege the reason, “ why the juice
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of apples in one year produces a constive belly, with violent colical pains; in another, a loose belly with scarce any gripes attending." Now I have been informed by others, that small quantities of new cyder will frequently produce a *diarrhœa* in any, and in every year. And Citois observes, that the colic, which infested the inhabitants of the province of Poitou, was often attended, "per initia præfertim, cum alvi frequenti, sed non ita copioso, fluore, sæpius cum ejusdem adstrictione." M. Doazam, who writes on this disease in the *journal de médecine* for the month of October, 1760, affirms that "Il en est plusieurs, qui non seulement n'ont point éprouvé de constipation, mais même qui se font plaints d'un flux de ventre." The same thing is sometimes observed in the case of painters, and of other workmen employed about lead. Some of them
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are cured by a spontaneous looseness of the belly. Mr. James Wilson, in the essays and observations physical and literary, published at Edinburgh, Vol. I. Art. 22. gives an account of a disease, called by the miners Mill-reck, which all the inhabitants of *Lead-Hills* are subject to, but particularly those, whose daily business it is to melt down the lead; and he observes, that, in the first stage of this disease, a *diarrhœa* sometimes makes a cure.

A question may be asked, “ If
 “ the mischiefs occasioned by cyder,
 “ particularly when it is new, arise
 “ from the poison of lead dissolved in
 “ it, how happens it, that all, who
 “ drink this liquor, do not suffer in
 “ proportion to the quantity of the
 “ poison swallowed; and that some
 “ people, who have long accustomed
 “ themselves to it, have never expe-
 “ rienced any of its bad effects?”

This difficulty, which subsists in its full force, whatever general cause be supposed, I do not take upon me to account for: possibly it is resolveable only by recurring to that inexplicable *idiosyncrasia*, in which there is so remarkable a difference among men. Be it remembered, at the same time, that the case is not singular, but exactly paralleled by that of the foreign wines; and that the physicians of Germany, who in the latter end of the last, and in the beginning of the present century, wrote concerning the adulterations by litharge, found reason to make the same observation. The words of Zeller are, “ Multi
 “ tamen, imo innumeri ab eo læsi
 “ non fuerunt, utut ad ebrietatem
 “ usque illud hauserint; alii leviter
 “ tantum.”

I SHALL only add, that it will not be easy to determine the exact quantity of lead dissolved and incorporated

with cyder, unless an assay be made soon after the adulteration has been received. For it seems probable, that, as was the case of the German wines, which, after a few months, lost that apparent, but pernicious, improvement, which fraud had given them, the cyder also may, in some time, deposit the greatest part of its poison. But that a very small quantity of this poison is capable of producing most terrible effects, is certain also from what was formerly observed. For, a calculation having been made, according to the method of adulteration described by Cockelius, it was found, that a measure of wine, called *mensura Wirtenbergica major*, which Reiselius estimates at sixty-four ounces, scarcely contained half a grain of litharge.

P O S T S C R I P T.

WHEN I first undertook the unpopular task of exposing what appeared to me to be a most dangerous provincial error, I was well aware, that much cavil and contradiction was to be expected; and that it would be very difficult to establish a truth, however clearly demonstrated, in opposition to the prejudices, the passions, and the interests of men. I have accordingly heard of several objections, made to my opinion; some of which are founded on false facts, and misrepresentation; others have indeed, at first sight, a specious appearance; but, when submitted to a more accurate examination, seem to lose all their validity, and importance. In hopes of preventing any farther disputation on this subject, I have stated the principal objections; and have subjoined my answers to each of them.

It

It is affirmed, that, in many parishes of Devon, the mode of compressing the apples, which I have described, is gone into disuse; and that, instead of the trough and roller, a machine, commonly called the *mill-engine*, or the *hand-engine*, is employed for that purpose. This is admitted to be a fact; particularly in the eastern parts of the county. But I have received clear information from several persons of credit, that, although no lead enters the structure of that machine, yet the vessel, placed to receive the apples, ground by it, is, in several parishes, lined with lead. As often as such a vessel is used, there can be no reason to imagine, that the danger, arising from lead, is removed by the *mill-engine*, substituted to the trough and roller.

It has been suggested, that the apples are frequently compressed in wooden troughs. Having made a

very strict inquiry, I do not find, that troughs, made entirely of wood, are now in use; the stone-troughs having been experienced to be more convenient. I find indeed, that the stone-troughs are generally enlarged round the top with wood; and that the two parts are joined together by means of long iron nails, driven through the wood into the stone; and that melted lead is poured into holes in the stone, made for its reception, with a view to fasten the juncture.

It is denied, that sheet-lead is nailed over any press in the county, one at Alphington excepted. To this I reply, that, in the year 1766, there were in several parts of the county, cyder-presses lined with lead. I am authorized to mention several parishes in the South-hams, where such presses were then used. But in the three parishes of Ide, St. Thomas, and

and Alphington, adjoining to, and intermixed with each other, not fewer than thirty presses, lined with sheets of lead, were to be found.

AN experienced phyfician informs me, that he has found, that feveral of his patients, received into the Devon and Exeter hospital, who laboured under the colic of Devonshire, had never drunk any cyder; and that the cyder, which others had drunk, was made in pounds, which had no lead in any part of their composition.

HOWEVER improbable it may appear to those, who know that cyder is the common drink, especially of the lower class of people in Devonshire, that an inhabitant of that county, received into an infirmary, should never have drunk any cyder; yet I will admit, that this assertion may possibly have been founded in truth. And I answer, that, although it is my opinion, that a solution of lead, in-

corporated with the common drink of the inhabitants of Devon, is the reason why the colic of Poitou is more endemial there, than in other parts of England ; yet I would not be understood to mean, that the inhabitants of Devon are exempted from the various other means, by which experience has taught us, that the same poison will be communicated. It is well known, that in the several counties of Northampton, Lincoln, Rutland, and Leicester, very little or no cyder is drunk ; and yet, in each of those counties, have I seen patients affected by the colic of Poitou. It will be hereafter shewn, that the poison, which is the specific cause of that colic, may by divers means be admitted into the human body ; and although, when it occurs in an inhabitant of the county, in which it is endemial, it should seem most probable, that it has been conveyed by the
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the means of cyder; yet it cannot be doubted, but that the various means of conveying that poison may operate there, which prevail in the other counties of England.

“ That the cyder, which others
 “ had drunk, was made in pounds,
 “ which had no lead in their com-
 “ position,” may likewise be admit-
 ted to be true; and yet, if we con-
 sider that more than one way has
 above been pointed out, by which
 that liquor may reasonably be sup-
 posed to be adulterated with lead,
 this evidence may perhaps appear to
 have no great force.

“ If,” says a very learned friend,
 “ the quantity of lead, which was
 “ obtained by your assay, were, in
 “ general, dissolved in our cyder,
 “ scarce any one of our great cyder-
 “ drinkers, who must daily swallow
 “ a grain or two of dissolved lead,
 “ could escape the dry colic; and,

“ in consequence, this county must
“ have been long since depopulated.”

I have reason to think, that the cause, which I have assigned, is as general, as the effect produced ; but as to the exact quantity of lead, which may, in general, be dissolved in the Devonshire cyders, that I by no means undertake to determine. If, from what has been said, it shall appear to be a probable supposition, that Devonshire cyders, in general, do contain even the smallest quantity of lead, the inference, which I have drawn, will not, I think, be disputed by any one, who knows what is the genuine, the specific operation of that mineral, when taken into the human body. And be it remembered, that, whatever cause of the endemial colic be supposed, it is undoubted, that equal quantities of that cause do not produce equal effects on all constitutions ; and that
many

many great cyder-drinkers have never been attacked by the disease. Be it likewise remembered, that the argument, urged by my friend, against a metallic solution, will be as valid against a poisonous acid; nor can we account for the reason, why the county has not been depopulated by one general supposed cause, any more than by the other.

THE same gentleman insists, that the servants of those farmers, who have a great deal of lead in their pounds and presses, are not more subject to the colic, than those of their fellow-parishioners, who use no lead at all; and that the servants and labourers of those, who make very poor, crude, sour cyder, are, of all persons, the most afflicted by this disease. The first part of this evidence is directly contradicted by that of several persons of accuracy, who have communicated to me their observations.

fervations. It may likewise be considered, as, in some manner, contradicted by the authority of Dr. Wall; who, in a cyder-county, where the dry colic is almost unknown, attended several patients, under that disease, occasioned by cyder, adulterated by means of sheet-lead, nailed over a press; and who likewise testifies, that all who drank the cyder, which had been kept in a leaden cistern, *were affected by it, as the lead-workers usually are.* Dr. Ingen-Houfz, who was very lately in Normandy, inquired whether or not any lead is used there in the *apparatus* for making cyder; and he was informed, that no lead is employed for that purpose in any part of that province. He likewise was informed, that, in the hospital at Rouen, there are generally many patients, under the colic of Poitou, such as potters, painters, and other workers of lead; but that there is in Normandy

mandy no endemial colic, which can be attributed to cyder. And, as to the latter part of my friend's evidence, if we recollect what has above been said of the several pernicious methods of making, and of managing cyder, which prevail in the county of Devon, the most probable conclusion will be, that if crude, sour cyder be most productive of the colic, the reason is, not only because the greatest acidity of the solvent will produce the strongest metallic solution; but likewise because both the farmers and dealers in cyder have unfortunately learned, that, among all the various things, which have been tried, lead is the most certain and effectual corrector of the sourness and austerity of their cyder*.

* I here appeal to the conscience of one person, in particular, whose zeal has induced him to oppose my opinion in print, whether it be not true that he has for many years sold sugar of lead to the farmers for the purpose of correcting sour cyder.

It

It having been suspected, that iron might possibly be dissolved in the cyder of Devonshire, many experiments were instituted on solutions of iron in different vegetable acids, in mineral waters, and in cyder, Hence it fully appeared, that all the strong solutions of iron in vinegar and cyder, became, even without any addition, of a deep black colour; and that, even when they were highly diluted, they shewed more or less of a livid tinge; very different from the strongest solutions of lead, which, of itself, rather made the liquor of a lighter colour.

It appeared likewise, that on dropping into any of the lighter chalybeate solutions, the smallest quantity of either of the two tests, above-mentioned, a deep inky colour was immediately the consequence, with more or less of a dark precipitation; but that the change of colour, and the

the precipitation, produced by the solution of orpiment, were the most remarkable. This perhaps might be owing to the astringency of the lime-water in that composition.

WHEN the same quantity of the same tests was applied to the strongest solutions of lead, under every similar circumstance, the result was entirely different. In these solutions no tinge of an inky colour was produced; but constantly more or less of a dark brown colour.

It appeared likewise, that, a strong infusion of an astringent vegetable being poured on solutions of iron and of lead in the same cyder, in the smallest equal quantities, the solution of iron was immediately changed to an inky colour; but that the solution of lead shewed no discoloration.

It may therefore be fairly concluded, that the smallest quantity of iron can hardly exist in cyder, without
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out being discovered both by the solution of orpiment, and an astringent vegetable infusion. It may also be concluded, that cyder, in which such an infusion makes no change of colour, does certainly contain no iron in its composition: that the same cyder, changing to a brownish colour, on the addition of the solution of orpiment, at once shews an impregnation of lead: and that, although the solution of orpiment makes an evident change of colour, and a copious precipitation in solutions both of iron and lead in cyder, even in small quantities, yet the colours of the two liquors are, in all their gradations, as plainly to be distinguished, as are those of ink, and Madeira wine; and consequently can never deceive persons, conversant with such experiments.

It may farther be observed, that all the precipitations, produced by the tests,

tests, or by an astringent infusion, when applied to solutions of iron, upon standing, became blacker; but that solutions of lead, thus treated, were seldom changed to a darker colour.

It is likewise remarkable, that an addition of more of the tests (after a certain quantity had been instilled) to the solutions of lead, did not in any degree heighten the colour of the liquor: whereas all the precipitates, produced by the tests, and by an astringent infusion, applied to solutions of iron, were always heightened in their colour, upon the addition of more of the precipitating liquor.

BUT (what will put the matter in question out of all doubt) various specimens of Devonshire cyder, which, on the application of the tests, had evidently appeared to have been impregnated with lead, when tryed by an astringent infusion, shewed no signs of a chalybeate impregnation.

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IN fine, it has been shewn, that a solution of lead is frequently to be discovered in the cyder of Devon. The various means, by which this liquor may be supposed to be thus adulterated, have been pointed out. That this is a cause sufficient to produce the Devonshire colic, cannot be controverted; and it seems to me most probable, that, as it is adequate to the effect, so it is the sole cause of that disease. Does not such a supposition appear to be agreeable to the general simplicity and uniformity of nature? In this opinion, however, I may have erred; but I shall be happy even in my error, if it shall excite some more successful inquirer to investigate, and to discover a truth of so much real importance to human society, and particularly so to the inhabitants of those parts of the world, in which this very formidable disease is endemial.

XIII. *An*

XIII. *An Examination of several means, by which the poison of Lead may be supposed frequently to gain admittance into the human body, unobserved, and unsuspected: By the same.*

Read at the COLLEGE, JULY 13, 1767.

ALMOST every day's experience furnisheth physicians with examples of painters, and plumbers, and the other numerous artificers, employed either in manufacturing the several preparations of lead, or in applying them to their respective uses; who, after having suffered the most extreme torments from the colic of Poitou, are restored to health, and remain free from that disease, so long, at least, as they quit their usual business, or pursue it with greater caution. But there is a

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chronic species of this malady, still more formidable in its effects, which not unfrequently occurs; and to which, as far as I have observed, persons of thin, tender, irritable habits, are particularly subject. The first beginnings of it are slight, and generally are, therefore, not much regarded. In this state, it is sometimes referred to causes which do not exist; and opposed by medicines, which perhaps tend only to co-operate with the disease. In the mean time, it steals on by slow progression; each successive paroxysm becomes more severe than the former; and the patient is at length reduced to the most deplorable state of infirmity. His muscles waste; his limbs are contracted; his respiration is difficult; and, after having, a long time, dragged on a most miserable existence, he dies, generally either convulsed, or apoplectic. In the first case, I mean that

that of the workers of lead, it should seem, that a large quantity of the poison is taken into the body, and at once produceth violent effects: in the latter, that it is gradually, and in small quantities, accumulated in the constitution; that it acts slowly and imperceptibly; and lays a foundation for irreparable mischief, before any alarm is taken. According to the testimony of Boerhaave, “tanto pe-
 “jus afficit, quo irrepit tectius; nec
 “se manifestat, nisi devictis jam
 “corporibus.” (Elem. Chem. vol. ii. proc. 170.) In the first case, it makes its attack in the manner of an open enemy. Those, concerned with it, well know the dangers and difficulties, with which they are to contend; and can even prepare and guard themselves against its power. In the latter case, it acts as it were by stratagem; secretly incorporates itself with our food and liquor; and has thus an

opportunity of undermining the first principles of animal life; becoming the parent of a most cruel disease, which, with all our care, circumspection, and experience, it is very difficult for us either to prevent, or to remedy. Zeller has the following observation concerning the effects of wine, impregnated with litharge, on some of those people, who drank only small quantities of it, “ Quibus
“ potus hic vel quotidianus est, vel
“ frequentior, non tamen adeo largus
“ ad inebriationem usque, illico quid-
“ dem exinde non læduntur, sensim
“ autem sensimque varia experiuntur
“ mala; quæ, cum ab initio levia
“ sint, neque curant neque animad-
“ vertunt; successive autem dolorem
“ hypochondrii sinistri, ventriculi
“ gravitatem, inflationem, et tabem
“ sentiunt.” It was probably from an observation of such slow, but certain effects of lead, that the French
and

and Italians took the hint of preparing their celebrated poisons, called *poudres de succession*; the basis of which has generally been supposed to have been that mineral. Zeller mentions a certain chemical operator, near the confines of Bohemia, who, after having diligently applied himself to the composition of poisons, did, by the means of lead, combined with some more volatile and corrosive substance, prepare a most slow poison; which, given to dogs, and other animals, had the power of destroying them, without producing any violent symptoms, and after several weeks, or even months. “Confirmavit hoc excellentissimus D. Præses, mihi que retulit se quatuor istiusmodi venenorum lentorum descriptiones vidisse, quarum quamlibet saturnus ingrediatur, paucis additis aliis acidis, acribus, in exigua tamen dosi, ita ut in quovis saturnus basin constituat.”

NOTWITHSTANDING the severe laws, which are still in force, both in France and in Germany, against the adulteration of wines, by the means of litharge, we still frequently find, that the small French white wines, and the rhenish and moselle wines, bear marks of this most pernicious fraud. And, in confirmation of this fact, Dr. Warren informs me, that, in the year 1752, thirty persons, belonging to a family* at that time in Hanover, were seized with the colic of Poitou, in consequence of having drunk a sweet French white wine, in which some preparation of lead had been dissolved.

THAT such an adulteration is ever wilfully practised on vinegar, there is no reason to suspect; for it would tend to destroy the most essential quality of that liquor. However, I have met with several specimens of vine-

* The family of the late Duke of Newcastle,
gar,

gar, which have evidently appeared to be impregnated with lead. Whether it might have been thus adulterated by means of glazed earthen vessels, in which it might possibly have been kept, or by what other means, I must leave undetermined. It is certain, that a liquor, so commonly used with our food, cannot be too cautiously guarded from a poison, which it so easily dissolves.

IN Holland, and perhaps in other countries, it has been customary to correct the more offensive expressed oils, so as to substitute them to oil of olives, or oil of almonds, by means of this metal. And we are informed by M. de Haen, that some years ago, when the mortality among the cattle had made butter extremely dear, some farmers, in the low-countries, had a practice of adding to the weight of it by a quantity of cerusse. What would be the effects of such

oil and such butter, taken into the stomach, it is very obvious to conceive.

THE custom, which prevails in many parts of this country, of keeping milk in leaden vessels, seems liable to a similar objection. One would naturally imagine, that it cannot turn sour in such vessels, without dissolving some of the metal. But on applying the *liquor probatorius*, to some milk which I had kept in a leaden vessel six days, I perceived no such discoloration of it, as shewed any saturnine solution.

It should seem likewise, that leaden vessels, or wooden vessels lined with lead, which are used in many families, for the purpose of keeping salted meats, ought not here to pass unnoticed. But Dr. Darwin, of Lichfield, informs me, that he applied the *bepar sulphuris* to some brine, taken from a leaden cistern, in which

which salted beef had been long kept; but that he observed no extraordinary discoloration. Here he suspected, that the lead might possibly have been precipitated by some putrescent parts of the flesh. He therefore steeped some bits of lead in salt and water, many days. But, on examining this water by means of the test, he saw no signs of a solution of lead. Upon a repetition of Dr. Darwin's experiments, I have found the result of them to be in no way different from what he mentions. I cannot, however, dismiss this subject, without observing, that in glazed earthen vessels, in which salted meats have been kept, I have sometimes seen evident marks of a corrosion.

BUT it cannot be doubted, that culinary vessels, lined with a mixture of tin and lead, may communicate pernicious qualities to acid foods. This custom of lining copper vessels
with

with tin, with a view to prevent any disagreeable taste, or bad effects from verdigrise, we find to have been very ancient. Pliny, in his natural history (lib. xxxiv. cap. 17.) expressly mentions, on what principle this method was practised. “Stannum, illitum æneis
 “vasis, saporem gratiorem facit, et
 “compescit æruginis virus.” It appears likewise, that tin and lead were frequently compounded for the purpose of lining copper vessels, in the time of Pliny. Galen, in his first book *de antidotis*, complains of this, as a dangerous mixture; and, on that account, we find him giving very particular directions, in what vessels his *pastilli theriaci* were to be kept. The intire passage, to which I allude, is as follows.

Ἡ δὲ ἀπόθεσις ἐν ἀγλείῳ
 κασσιτερίῳ, ἢ ὑαλίῳ, ἢ χρυσῷ γινέσθω.

Τὸ μὲν ἐν ὑάλινον καὶ τὸ χρυσῷ ἐδεμίαν
 ἔχει τὴν δόλωσιν· τὸ δὲ κασσιτέρινον μίξει
 μολίσθου δολοῦται. Τὸ τοιῶτον ἐν φεύγειν

προσθήκει,

προσῆκει, ἔ μόνον ἐπὶ ταύτης, ἀλλὰ καὶ τῶν ἄλλων ἀντιδότων ἀπάσων. However unnecessary this caution of Galen may appear to have been, with respect to the keeping the *pastilli theriaci*, supposed already dry, in a vessel compounded of tin and lead; it will hardly be doubted, but that great mischief may be apprehended from the use of such a metallic mixture, when applied to many culinary purposes; if it be considered how readily lead is dissolved in all the vegetable acids, as well as in oily and fat substances.

UPON inquiry into the composition, which is ordinarily used for lining copper vessels, I find it to consist of block-tin and lead, in different proportions, laid on with a solution of crude *sal ammoniacus*, or resin. It seems probable, that this composition is made with more or less lead in an arbitrary manner, as the artist chuseth. There is one person
in

in this town, who professeth to line his copper utensils with block-tin, without any other metallic addition. Others, of the same trade, insist that this cannot be done. Some even justify the mixture of lead; and contend that, by the means of it, the metal acquires a brighter colour, more like silver. Upon examination, I find, that it is much more difficult, as well as more expensive, to line vessels with pure tin only; that the metallic composition, being more malleable, is more easily spread over the copper; and that to lay on pure tin requires a peculiar dexterity, which few or none of the common artists are masters of. And I am informed, that, even when the common artists do honestly intend to line their vessels in the best manner, although they do spread a coat of pure tin on the surface of the copper, clean scowered, and washed with a solution
of

of the crude *sal ammoniacus*; yet they do not possess the art of finishing their work perfectly, unless by covering the surface with a composition, in which there is a very large proportion of lead, namely, the proportion of ten ounces of lead to sixteen of tin; which increased quantity of lead brings the composition very near to the common standard for tinning copper vessels.

I HAVE in my possession several specimens of the metallic mixture, used for this purpose, which I collected from different shops. That lead made a part of this composition, was manifest from its softness, easy fusibility, and easy calcinability. But in order to prove this with greater certainty, I filled the same bullet-mould exactly with the melted metals mentioned below. Their weight in air was as follows.

N° I.

N^o 1. Pure block-tin, 190 grains.

N^o 2. A composition made of sixteen parts of tin, and ten of lead, 217 grains. Increase 17 grains.

N^o 3. Tinning metal, of one shop, 212 grains. Increase 22 grains.

N^o 4. Tinning metal, of another shop, 218 grains. Increase 28 grains.

N^o 5. Pure lead, 286 grains. Increase 96 grains.

BUT I am informed by a person, conversant in this business, that, in order to determine, whether or not the metal, used for the purpose of covering copper vessels, contains a mixture of lead, no other experiment is necessary, than to rub the surface of it with a finger; which, when lead enters the composition, always contracts a livid, blackish colour; but is not discolored, when rubbed on pure tin only.

In

IN order to determine, whether fauces are ever really impregnated with lead in the common culinary vessels, I ordered a mixture to be made of butter, water, and salt; and one eighth part of distilled vinegar to be added. This composition, after it had remained twenty hours in the tinned vessel, in which it was made, and heated, was again exposed to the fire; and a small portion of it being examined by the volatile tincture of sulphur, became immediately of a dark brown colour. A small quantity of the *hepar sulphuris* (prepared in the manner already described) having been dropped on another portion of the same fauce, occasioned a discoloration still darker.

ANOTHER fauce, exactly of the same composition, was prepared in the same vessel; and was immediately examined in the manner before-mentioned. The result of these trials was

was nearly similar to that of the former. Only the discoloration was less dark.

ANOTHER sauce was made in the same vessel, exactly of the same materials, and in the same quantities; to which the proportion of distilled vinegar, above-mentioned, was added, after it was poured into a glass vessel. Upon this mixture the same trials were made with both the tests. But no such change of colour was observed. The *hepar sulphuris* only made it whiter, than it had been before that addition.

THE gradation of colours in the three sauces, on which the trials had been made, was so evident, that a person, who had not been present, when they were made, had no difficulty in determining, which sauce contained the greatest quantity of lead; which had the least; and which had none.

THE same sauce, having been prepared in a silver vessel, was kept in it twenty-four hours. But, on the application of the tests, its colour was not affected.

THE same trials were afterwards made on some clear soupe, made at a tavern, in the preparation of which several acid vegetables had been used. Both the volatile tincture of sulphur, and the *hepar sulphuris* produced in it a dark colour.

IN Neuuman's chemical works, translated by Dr. Lewis, page 460, there is a note subjoined by the editor, respecting the habitude of tin to the acetous acid; Neuuman having found that this metal does not dissolve in vinegar, and Margraaf having affirmed that it dissolves in it with ease. From some experiments, which Dr. Lewis made on plates of tin, put into common vinegar, and into the acid juices of fruits, he con-

cludes, that, although tin may not be soluble in these acids, with regard to the purposes, for which the chemists want such a solution; yet that tin, or tinned vessels, however pure the tin be, will give a metalline impregnation to light vegetable acids, suffered to stand in them for a few hours.

I do not undertake to decide a question, concerning which men of such chemical experience have differed in their testimony. But it seemed necessary to determine, whether or not any solutions of tin, in the vegetable acids, could deceive us in our trials with the tests. Therefore the following experiments were made.

I. INTO some vinegar, in which a thin piece of block-tin had been left twenty-four hours, were instilled several drops of the solution of orpiment. Only a deep yellow colour was produced.

II. INTO

II. INTO an equal quantity of the same vinegar, the same quantity of the solution of orpiment was instilled. The colour of the mixture was exactly the same, as in the former experiment.

HENCE it appeared, that the vinegar had received no addition from the tin, which was demonstrable by that test.

III. To the vinegar, of the first experiment, after it had stood near three weeks on the tin, the same quantity of the solution of orpiment was added. The appearance of the mixture was exactly the same, as in the first experiment.

IV. A FEW drops of the volatile tincture of sulphur were added to the vinegar, of the first, and of the third experiment. No change of colour was produced, which was not equally produced by the same addition to pure vinegar.

V. IN order farther to determine, whether any solution of tin in the vegetable acids could possibly deceive us in our trials with the tests; I put into a sand heat

common vinegar,	} with a thin	
essential salt of forrel,		} plate of
juice of lemons,		

These, after maceration for twenty-four hours in B. A. were examined by means of both tests. But neither of them shewed any discoloration, except what the same tests had before produced in pure vinegar.

It is, therefore, fairly to be concluded, that pure tin yields nothing to vegetable acids, which can make our experiments on common tinned vessels, by means of the tests, fallacious.

FROM what has been premised, does it not seem reasonable to imagine, that the health, at least of persons of tender constitutions, may sometimes

times receive injuries from the use of acid sauces and soupes prepared in such vessels? Particularly, is it not probable, that the bowels of children may frequently suffer from their food, in this manner impregnated with lead? And, in general, may it not justly be concluded, that some of the slighter disorders of the first passages (which one practitioner may perhaps attribute to indigestion, another may call, by a fashionable term, *bilious*, *nervous*, *scorbutic*, or by other terms, too often expressive of nothing, but our own ignorance) may be the first effects of a concealed poison? And may not some part of that benefit, which our health usually receives, on our quitting, for some time, the accustomed place of our residence, arise from the circumstance of our quitting the daily use of something deleterious, which we may have been accustomed to swallow with our daily nourishment?

NOR is there less danger to be apprehended from the use of the common glazed earthen vessels. It is well known, that the *calces* of lead are more easily dissolved in the vegetable acids, than the crude metal. Vinegar, boiled with the glass of lead, or in the glazed earthen vessels, the glazing of which is principally lead, becomes strongly impregnated with the pernicious qualities of the metal; and yields, on evaporation, a true *saccharum Saturni*. But this glazing is very considerably acted upon even by cold vinegar. And hence it is manifest, that the custom, which I apprehend to be too common, of keeping pickles in such vessels, cannot but be dangerous to health. And the same observation may, on the same principle, be made on a practice, which, I find, prevails, particularly among the lower class of people, of baking their fruit-tarts in a cheap kind of glazed

glazed earthen ware. A friend of mine lately informed me, that, having observed a currant-tart, in such a dish, he expostulated with the mistress of the family on the danger, which might be apprehended from this custom; and that she answered, that “she gave the preference to that sort of earthen ware upon a principle of frugality; it being a fact commonly known by all good housewives, that fruit, baked in those vessels, requires a much less proportion of sugar to sweeten it, than when baked in any other vessel whatever.”

HERE then is a remarkable instance of a most insidious poison, taking as it were an advantage of our necessities, and recommending itself to us by means of a quality, which at once favours œconomy, gratifies the palate, and may lay the foundation of a painful, lingering disease, more formidable than death.

WHEN the distillation of simple waters was first introduced, we find that leaden alembics were used, on the following principle; because lead, on account of its frigidity, was supposed to have a power of very easily converting the vapour, arising from plants, into water. Matthiolus, who contends, that more water may be distilled by a leaden alembic than by one made of any other metal or matter, mentions, that some inconveniences had been experienced from lead applied to this use; namely, that the water, thus extracted, was apt to taste of smoke, and not to retain the peculiar flavour of the plant or flower; that it was apt to acquire a sweet taste from the lead; and was not only disagreeable to the sick, but that it sometimes brought great mischief on the breast, the stomach, the liver, and the other *viscera*, having contracted a deleterious quality from the metallic

metallic vessel.—“Fit quidem, ut
 “superficies ipsa” (*scilicet plumbei
 alembici*) “in cerussam tenuissimam
 “vertatur; quæ deinde, aquis sese
 “immiscens, illis dulcedinem addit.
 “Atque id videre est in albo talium
 “aquarum sedimento; præsertim ubi
 “aquæ per plumbeum alembicum
 “recens paratum meaverint. Nam
 “vas, quod diu in hoc opere usur-
 “patum est, obducta circumquaque
 “quadam veluti gypsea crusta, non
 “ita facile a vaporibus deraditur
 “et in cerussam vertitur.” *Pet. And.
 Matthiolus de ratione distillandi aquas
 ex omnibus plantis.*

ALTHOUGH leaden alembics are now
 entirely out of use, it would appear,
 that this observation of Matthiolus
 was well founded. That an acid
 arises during the latter part of the
 distillation of simple waters, is very
 certain. This is manifest from its
 frequently coming over impregnated
 with

with copper, when the alenibic is not properly tinned. And Boerhaave, in his *elementa chemiae*, vol. ii. proc. 171, has proved, that lead is convertible into cerusse, even by the very mild acid, which first arises in the distillation of vinegar, and which indeed scarce manifests to the taste any marks of acidity.

It seems not improbable, that, if we had an opportunity of making an accurate inquiry, we might see reason to conclude, that the disease, called popularly the dry-belly-ach, which is common as well in the northern colonies of America, as in the islands of the West-Indies, ought to be referred wholly to lead, as its cause. Those physicians, who have mentioned this disease in their writings, have, in general, considered its cause in a vague, undeterminate, unphilosophic manner. They generally bring together several causes, very different from

from each other ; which are not proved to be adequate to the effect produced. The following is the language, which we generally meet with in books. “ New rum, and a
 “ great quantity of fresh and unripe
 “ lemon and lime-juice, made into
 “ punch, seem to be commonly the
 “ causes of this disorder in the West-
 “ Indies ; as distillers of rum, boilers
 “ of sugar, and over-seers, are chiefly
 “ subject to it : the first, who are
 “ generally of the poorer sort, from
 “ immoderately drinking new, hot
 “ rum ; the second and third from
 “ taking cold, after sweating in hot
 “ boiling houses, and drinking very
 “ strong punch, made with fresh
 “ limes, and newly distilled rum.”

I am informed by an intelligent person, who resided some time in the island of Jamaica, that very few, if any inhabitants of the West-Indies, who are nice in the choice of rum,
 that

that is, who drink it of a proper age, are afflicted by the dry-belly-ach; and, that the persons, particularly subject to this malady, are under-servants, and those slaves, who attend the boiling, and the distilling houses. But this gentleman likewise supposeth, that there are other causes, which concur in producing this effect, particularly the crude, unripe lemons and limes, with which these people make their punch. He likewise observes, that the people, who are the most tormented by the dry-colic, are such as are obliged to work, or attend, day and night, in the boiling houses, during the crop-season, surrounded by a constant atmosphere of smoke from the boiling sugar, and subject to perpetual streams of cold air, from the doors and windows, which are always open.

In the island of Jamaica, as I am informed, the sugar-coppers are rimmed

med with lead; and the spouts are lined with the same metal. The still is copper tinned; the still-head tin or pewter; as is the worm of the refrigeratory.

My information from the island of Antigua is, as follows. “The sugars are boiled in copper vessels; the skimmers and ladles are made of copper; the wall, in which the coppers are hung, is covered with lead. The molasses is received in a wooden cistern, and carried to the still-house in wooden pails; fermented in wooden vessels; distilled in copper stills, with pewter, or copper heads tinned; and pewter worms. The worms and stills are commonly sent from London, and from Bristol, to the island of Antigua.”

WHAT is, in general, the composition of the metallic mixture, used for the purpose of lining copper-vessels,

vessels, has already been fully explained. As I am instructed, all the pewter, that is prepared in this country, the very best kind of it only excepted, contains a quantity of lead. That, made in Holland, contains a very large proportion of this metal. The very best pewter is said to be a compound of tin, and the martial regulus of antimony; in the proportion of one hundred pounds of the former to seventeen pounds of the latter. The worms and stills, which are sent from hence to the West-Indies, are said to be made always of the inferior sorts of the composition, called pewter.

My suspicions, concerning this subject, have been greatly confirmed by the authority of Dr. Franklyn of Philadelphia. That gentleman informs me, that, at Boston, about forty years ago, leaden worms were used for the distillation of rum. In

consequence thereof, such violent disorders were complained of by the drinkers of new rum, that the government found it expedient to enact a law, forbidding the use of any worms, except such only as were made of pure block-tin. This law having been enacted, the dry colic was much less frequently heard of than before. But the law was complied with only in part; for, from that time to the present, instead of block-tin, they have used a pewter, containing a large proportion of lead. Dr. Franklyn likewise informed me, that the colic of Poitou is not so frequent a disease in any of the colonies, as it was formerly; and that the reason, commonly assigned, is, that the people now drink their punch very weak in comparison with what they were formerly accustomed to; which used to be rum and water in equal quantities. He added, that they now also
drink

drink their punch, with more juice of fresh limes in it; and, as that juice, joined to certain laxative medicines, is at present their common remedy, when any are seized with the disease, so it is generally considered as the best preservative against it.

I AM likewise informed by a gentleman, who resided many years in the Bahama-islands, that the dry-belly-ach has hardly been known in those islands, since the inhabitants have left off the distillation of rum. The same gentleman informs me, that the people of the Bahama-islands drink very large quantities of small punch, made extremely acid by the juice of limes; many of the labouring people to the amount at least of two gallons every day.

It is hoped, that what has here been thrown out concerning the most probable cause of the colic, which is endemial both in the West-Indies,
and

and on the continent of America, may appear to those, who have opportunities of making a more accurate inquiry, to be not unworthy of their attention.

ONE instance of the great caution of Galen, with respect to the use of lead, has already been mentioned. In another part of his works, after having recommended pure rain water, as the most proper for the preparation of a medicine, of which the heads of poppeys were the *basis*, he particularly directs, that water, flowing through leaden pipes, is to be avoided. Τὸ ὕδωρ, διὰ τῶν μολυβδίνων σωλήνων ὀχετεύμενον, φευκτέον. ἰλύματα γάρ τινα τῷ μολύβδῳ κατὰ τῆτο περιέχεται. Διὸ καὶ οἱ πίνοντες ὑποσάθμην τῷ τοιούτῳ ὕδατος δυσεντερικοὶ γίνονται. But, long before the time of Galen, Vitruvius (*de architectura, lib. viii. c. vii.*) had published a very strong remonstrance against leaden pipes, when used for

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the purpose of conveying water.

“ Multo salubrior ex tubulis aqua,
 “ quam per fistulas: quod per plum-
 “ bum videtur esse ideo vitiosa, quod
 “ ex eo cerussa nascitur: hæc autem
 “ dicitur esse nocens corporibus hu-
 “ manis. Ita si quod ex eo procreatur,
 “ id est vitiosum, non est dubium,
 “ quin ipsum quoque non sit salubre.
 “ Exemplar autem ab artificibus
 “ plumbariis possumus accipere, quod
 “ palloribus occupatos habent corpo-
 “ ris colores. Namque cum fundendo
 “ plumbum flatur, vapor ex eo infi-
 “ dens corporis artus, et indies exu-
 “ rens, eripit ex membris eorum san-
 “ guinis virtutes. Itaque minime fis-
 “ tulis plumbeis aqua duci videtur, si
 “ volumus eam habere salubrem *.”

The commentators have differed in

* Palladius (August. tit. xi.) maintains the same opinion. After having considered the several other methods of conveying water, he adds,
 “ ultima ratio est plumbeis fistulis ducere, quæ
 “ aquas noxias reddunt. Num cerussa plumbo at-
 “ trito creatur, quæ corporibus nocet humanis.”

their

their opinions, with respect to this passage. The Marchese Gagliani defends Vitruvius. “Pare, che l’acqua sola

“non sia capace di estrarre dal piom-

“bo la cerussa; ma non potendosi

“negare che è quasi impossibile tro-

“vare acqua che non contenga al-

“cune, anchorche insensibili, parti-

“celle, o acide, o saline, conviene

“uniformarsi, ne casi che si puo, al

“sentimento di Vitruvio.” On the

other hand the French commentator,

M. Perrault, opposeth to the opinion

of Vitruvius, “Qu’il n’y a aucune

“apparence, que l’eau puisse changer

“le plomb en cerusse, puisque même

“elle n’altère, en aucune façon,

“le cuivre, qui est bien plus aisé

“à rouiller. Car on ne voit point,

“que les robinets des fontaines soient

“rongés par l’eau, après avoir servi

“cent ans.”

It therefore appearing to me of importance to determine, which of

these two contrary opinions is founded in truth, I kept some water of the river Thames, some water of the new river, and some spring water in three leaden pipes, and agitated the contents of each pipe, almost every day, during two months. I then very carefully examined the three several waters by the means of the tests above-mentioned. But there appeared not in either of them any discoloration, which could be supposed to manifest a solution of lead. I afterwards tried the same experiments on some water of the new river, which had been kept a fortnight in an old rusty leaden pipe, long used for the purpose of conveying water. But I could not even here find any sufficient reason to suspect a saturnine solution. Some water likewise, collected from the hollow parts of the leaden covering of a church, shewed no marks of lead, when examined in the same manner.

The

The caution therefore of Vitruvius and of Galen, as likewise that of Aëtius (who condemns the use of rain water, which has flowed down from a roof, covered with lead) could not but appear to me unnecessary, except in a case where a quantity of vegetable acid might be supposed to render the metal dissoluble in water; by which means, as we are informed by M. Tronchin, an epidemic colic, similar to that of Poitou, was occasioned in the city of Amsterdam. But Dr. Heberden has lately shewn me some water, which has been twelve years kept on bits of lead. The phial, in which this water had been preserved, had not only a copious white precipitation at the bottom of it, but its sides also were almost covered with a crust of the same colour.

ON a little of this water (which was quite pellucid) I dropped a small quantity of the solution of orpiment. It immediately became of a very dark

colour; and, after having stood a few hours, deposited a deep black sediment.

THE same water, having the same quantity of the volatile tincture of sulphur dropped into it, became of a clear reddish brown, not unlike that of the common Madeira wine.

I filtered a little of the same water; and then dropped into it the same quantity, as before, of the solution of orpiment. But it produced no sensible change of colour; nor did an increased quantity of the solution make any other change in it, than what would have been made in any other pure filtered water.

EXACTLY the same *phænomena* were observed, upon the addition of the volatile tincture of sulphur to a little of this filtered water. No other change of colour was produced, than what any other liquor of the same colour, mixed with pure water, would have occasioned.

HENCE

HENCE it appears, that lead is not capable of solution in water, even in twelve years, but only of mixture and suspension. But it likewise appears probable, that so much lead may be thus mechanically mixed with, and suspended in water, as to communicate to it noxious qualities. So that we see the reason, why the ὑποσάθην τῶ τοις τῷ ὕδατος, *the sediment of such water*, may, according to the observation of Galen, render those, who swallow it, δυσεντερικὸς, *subject to disorders in the intestines*.

HIERONYMUS Mercurialis is of opinion, that the ancient Romans, in general, were very apprehensive of the dangers, arising from the common use of lead. His observations, on the remains of the aqueducts of Rome, induced him to think, that the old inhabitants of that city avoided, as much as possible, leaden pipes, particularly for conveying that water,

which was not only to serve for the purposes of cleanliness, but likewise for the preparation of their food. Indeed he can scarcely imagine, that the water, which was brought from the mountains of Tybur, (the modern Tivoli, sixteen miles from Rome) was much, if at all, used in the preparation of their meat and drink; since Galen, who was a curious observer of every thing relating to that city, asserts, that all the water, conveyed to Rome from Tybur, was crude, and unfit for boiling food; adding, that Rome was furnished with many very excellent springs, useful to the sick, as well as to those in health.

Not long ago, M. Thierry, regent of the faculty of physic at Paris, published his short notes and observations, concerning the colic of Madrid and its neighbourhood. We are here informed, that this colic, which is described as assuming the characteristics of

of that, which raged in the province of Poitou, towards the end of the sixteenth, and in the beginning of the seventeenth century, is very frequent at Madrid, and in great part of New Castile in Spain. In his general view of the causes, which conspire to render this disease so frequent in those parts, he entirely excludes a cause, to which it has generally been ascribed, namely, four wines; insisting that the wines of la Mancha, which are principally drunk in Castile, never become sour; and moreover that the honesty of the people would not suffer any such criminal frauds to be practised, as might endanger the lives of the inhabitants of whole cities. He likewise contends, that the food is, in general, wholesome in its nature, and that it is used with great moderation. But, according to this author, the unequal temperature of the air, and the elevated situation of Castile, are the

the principal causes of that disease; which M. Thierry informs us, is, on that account, less frequent at Toledo, than at Madrid and Alcala; and is hardly known on the borders of Navarre. And, if we could run over the whole globe, he thinks it probable, that we should find this disorder more frequent under the tropics, than in regions nearer to the poles; and always more frequent in the middle of every country, or near the coasts bordering upon the ocean, than near to rivers, or the Mediterranean sea.

Not to enter into a discussion of this author's theory, which is evidently liable to various objections, I shall content myself with observing that, to examine very particularly, whether or not that poison, which is known to be sufficient to the effect produced, is not, by some general unsuspected means taken into the stomach,

stomach, would be a very interesting inquiry to the inhabitants of Madrid, and its neighbourhood. For, notwithstanding what M. Thierry has asserted, may not there be, either by means of fraud, or of accident, in the wines, drunk at Madrid, a saturnine adulteration? We learn from Hoffmann, "*vina, quæ circa Madrid proveniunt, austeriuscula esse, minus dulcia, et citius etiam acescere in calidis locis.*" And Neuumann informs us, that most of the Spanish wines are composed of fermented or half-fermented wine, mixed with inspissated Must, and variously manufactured; or of an infusion of dry grapes in weak Must. If, according to the testimony of Hoffmann, the wines, about Madrid, are austere, and apt soon to turn sour, they cannot by any means be more effectually corrected, than by a poison, which, almost in every country, has been

been applied to that use. And if we are rightly informed by Neuumann, that the Spaniards inspissate their Must by decoction; from what has been observed in a former dissertation, it will be obvious to conjecture, by means of what accident the wines, thus manufactured, may have power to occasion an endemial colic. May it not reasonably be imagined, that some part of this endemic evil may be owing to glazed earthen vessels, which are generally used at Madrid, for almost all culinary purposes? A physician, who has long resided in Portugal, is of opinion, that the frequency of the same disease, at Lisbon, is principally to be ascribed to that cause. But it is probable, that, at Madrid, where it is much more frequent, various other means may prevail, whereby the same poison may be taken in by the inhabitants, together with their nourishment.

ment. This subject deserves the strictest examination.

IN order to confirm the general doctrine, which has been advanced in these papers, concerning the pernicious effects of lead, taken internally, I here subjoin instances of much mischief done by very small quantities of that mineral. The three first were communicated to me by Dr. Heberden. The last I owe to the favour of a learned physician, of undoubted credit.

How very small a quantity of lead will sometimes bring on the peculiar mischief, which it occasions in the human body, appeared in the case of one, who, after frequently making bloody water for five years without pain, or inconvenience from going in his carriage over the stones, for the next two years made no other; at the end of which he died. Upon opening the body, the substance of
the

the left kidney appeared to be changed into little bags full of *sanies* and blood; but no stones were found in the urinary passages; nor had any ever been voided. While the blood was coming away in such an extraordinary quantity, the patient was advised to put himself under the care of one, who gave him a grain of sugar of lead, morning and evening, for four days; and then once in two days for three or four days more. The discharge of blood was not at all checked by the sugar of lead; but this small quantity was sufficient to bring on loss of appetite; intolerable uneasiness of the stomach and bowels; want of sleep; costiveness; and a paralytic weakness of the hands, which continued upon him for three weeks. The same quantity given to a patient, in a little different manner, four grains being taken in a day for three days, occasioned intolerable
uneasiness

uneasiness in the bowels for some months.

A woman, who had a *fluor albus*, took, by the advice of a nurse, one drachm of sugar of lead in the space of nine days. In consequence of this, she was afflicted with great pains all over her body, for above half a year, but not particularly in her stomach and bowels, except after eating; and the *fluor albus* was not at all restrained.

DR. Heberden observes, that all people are not equally affected with equal doses of this poison; and that this property belongs to it in common with all the nervous poisons; every one of which, as is daily experienced in *opium*, affects different people very differently.

HE observes likewise, that it is greatly to be wished, that lead could be given with more safety; as it possesses powers, which are often
much

much wanted, and which are not to be found in any other simple. One of the persons, mentioned above, by taking four grains of sugar of lead, had a flooding stopped, which had lasted for two months, unchecked by all the most powerful astringents in common use. But, he adds, the good effects are not so certain as the mischief; and, in most cases, would be far over-balanced by it.

A gentlewoman, aged about thirty-three years, had been, for two years, subject to almost a constant *hæmorrhagia uterina*; for there had been, during that time, very few days, in which she had been quite free from it. For several days together, she frequently lost half a pound of blood in a day. Some time before this disease began, she had suffered a difficult and dangerous labour; but having had no extraordinary hæmorrhage at that time, or for some months after it,

it, she could not attribute her disorder to that cause. She had tried several medicines without effect. She had particularly taken the peruvian bark, both in the extract, and in the decoction; which did not stop the flux. A large spoonful of Eaton's styptic, taken twice a day, stopped it for several days; but it heated her so much, that she could not continue the use of that medicine. A physician was consulted on the seventh of February, 1761. He found, that, for several days past, she had daily lost at least eight or nine ounces of blood. She was now pale, weak, and emaciated. She had observed no difference with respect to her disorder, from the effect of any food; and had equally suffered, whether she confined herself at home, or went out to take the air in a coach. He ordered the *emplastrum roborans* to be applied to her loins; and the following draught to be taken twice a day.

℞ *Corticis peruviani, in pulverem contriti, unciam unam;*

Aquæ puræ, uncias sedecim:

Decoque ad uncias duodecim, et cola.

℞ *Hujus decocti, fescunciam;*

Tincturæ corticis peruviani simplicis, drachmas duas;

Tincturæ saturninæ, guttas viginti;

Syrupi balsamici, drachmam unam. misce.

ON the tenth of February, the dose of the *tinctura saturnina* was increased to thirty drops; and the draught, with that addition, was taken twice a day. On the twelfth, finding that, though the medicine had agreed well with her stomach, yet the flooding was not considerably abated, he prescribed, instead of the draught, one large spoonful of the following mixture, to be taken every morning and evening.

℞ *Aquæ puræ, uncias tres;*

Sacchari Saturni, grana decem;

Spiritus

Spiritus vitrioli tenuis, guttas duodecim. misce.

AFTER she had taken four doses of this mixture, the flooding was much abated; but she complained of pains in the bowels, and of a sensation, as if they had all been drawn to her back; and likewise of pains about her stomach, and a straitness in breathing. Judging these to be symptoms of the colic of Poitou, occasioned by the *saccharum Saturni*, he ordered the following draught, to be taken immediately.

℞ *Aquæ alexeteriæ simplicis, fescunciam;*

Tincturæ senæ,

Electarii lenitivi, singulorum drachmas duas. misce.

THIS medicine opened her two or three times. The physician then ordered an oily mixture; which she could not keep on her stomach. On the next day he repeated the laxative draught, which still kept her body

open. On the next day, though the gripes had ceased, she complained of a sickness of her stomach; and vomited all her food, as well as an oily medicine which she had taken. At night the physician ordered the following pills, to be taken immediately.

℞ *Extracti cathartici, scrupulum unum;*

Extracti thebæici, granum unum.

Dividatur massa in pilulas quinque.

She passed the night tolerably easy, though without sleep. She had no return of vomiting for seven hours; and the next day had two stools. But then she began to vomit all that she had eaten, or drunk. The physician then applied a plaster of *theriaca Andromachi*, with some *oleum nucis moschatæ expressum*, to the region of the stomach; but without effect. At night he repeated the pills, of *extractum catharticum*, and

—*thebäicum*; which had the same effect as before; that is, they made her pass the night without vomiting, and gave her a motion or two on the next day. In the afternoon, when she was threatened with a return of vomiting, he gave her one scruple of salt of wormwood, together with a large spoonful of juice of lemons, in the act of effervescence. This she threw up; but afterwards vomited no more.

THE physician observes, that this was a degree of the true painter's colic; and that it appears, by this instance, that sugar of lead is, in such a case, a dangerous medicine, at least in the dose in which it was here given; but that it must however be remarked, that, during the time of the disorder in the stomach and bowels, the flooding was either inconsiderable, or totally stopped. The *extractum catharticum cum opio*, he thinks,

was manifestly of service, by stopping the vomiting, and giving stools.

He understood afterwards, that, in about a fortnight after he had left the patient, upon a return of the flooding, the apothecary had unadvisedly repeated the solution of the sugar of lead; which produced precisely the same bad effects as before. However she again got the better of her remedy, and continued for some time with her flooding as before.

SOME months afterwards the physician saw this patient. She then looked like a person in good health; and said she was so. Her account was, that, after he had left her, she returned to the use of the peruvian bark, although she had taken it ineffectually before. But partly to that, and chiefly to the use of florence-wine at her meals, she herself ascribed her recovery.

FROM what has been offered on this subject, it may fairly be inferred, that

that lead, taken into the stomach, is a poison, I do not say, *ex proprietate naturæ et tota substantia*, but, which is capable of doing more hurt than good to the generality of men, in all the known ways of using it; and consequently that it cannot be avoided with too much caution.

BUT is this metal, even when confined to external uses, entirely innocent, and free from suspicion*? I have some reason to doubt, whether litharge, the common *basis* of our plasters, when used for the purpose of dressing issues, has not, in certain irritable constitutions, produced some of the ordinary effects of saturnine preparations, taken internally. There have been instances of children, thrown into convulsions, by cerusse, sprinkled on excoriated parts. Zeller quotes,

* Dr. Petit informs me, that M. Goulard's poultice, applied for some time to a patient's knee, in St. George's hospital, occasioned violent pain in the bowels, which did not cease, until the poultice had been removed,

on the authority of Moglingius, a remarkable instance of the pernicious effects of litharge, outwardly applied.

“ De lithargyrio quoque mihi nar-
“ ravit, matronam quandam nobilem
“ pulverem ejus, in rubore faciei,
“ postquam hic ipsi tanquam singu-
“ lare et certissimum arcanum de-
“ prædicatus fuisset, in petia ligatum,
“ axillis bis vel ter die aspersisse cum
“ præsentaneo effectu; verum exinde
“ subsecuta fuisse dyspnœam, lipo-
“ thymiam, dolores vagos in abdo-
“ mine, vomituritionem, et nause-
“ am.” I have lately met with a

most violent and obstinate colic, which seemed to have been occasioned by some litharge, mixed in a cataplasm, and applied to the *vagina* with a view to allay a troublesome itching. And M. Doazam, in the *journal de medicine*, for the month of October, 1760, page 302, relates, on the authority of M. Verdelhan, a remark-

remarkable case “ de la femme d’un
 “ plombier lamineur, qui avoit é-
 “ prouvé une vive douleur de ma-
 “ trice, en forme de colique, pour
 “ avoir mis dans sa chauffrette des
 “ petits charbons mêlés de scories de
 “ plomb, et en avoit reçu inconsi-
 “ dérément les vapeurs.”

THAT the vapour, which exhales from melted lead, is capable of exciting the disease, which is our present subject, is a fact, frequently exemplified in the case of plumbers, and potters, and those who are employed in making *shot*. But farther, it is proved by the experience of printers, that the using *types**, which have been suffered to stand too long before

* The types of printers have always some lead in their composition. Whilst I am correcting this sheet, Mr. Nichols, the printer, informs me of the following fact. “ A cat, in a printing-office, is sometimes distressed for want of water. In this situation, he licks every thing, that is in his way, in quest of moisture. If he happen to lick the *types*, immediate madness is the consequence; the certain cure of which is immersion in cold water.”

the

the fire, in order to dry them, has been followed by weakness and contraction of the fingers. Nay, from several cases, which have been related to me on good authority, I have had reason to suspect, that the vapour of this metal, even when heated by friction only, has occasioned the colic of Poitou with all its consequences.

BOERHAAVE, who was particularly apprehensive of the dangers, arising from this poison, gives us a caution against the external application of the *acetum plumbi*, in the following words. “ Si dilutum corpori affricetur, pustulas, rubedines, erysipelas, phlegmonas, multum levat; cuti candorem, nitoremque conciliat; sed corpori nocet, tandem in phthisin deducendo, ut tristissimis sæpe constitit exemplis.” *Element. Chem. p. 3. vol. ii. proc. 172.* And we want no authorities to testify, that the too fashionable application

tion of cerusse to the skin has been followed by obstinate colics; pains, tremors, and resolution of the limbs; slow wasting fevers; and a pulmonary consumption. For such frequently has been the fate of those, who have thus endeavoured to supply the defects of their persons by a vain and temporary imitation of beauty; without having reflected, that health, as it is the only real source of beauty, so it is its only real preservative.

As it is observable, that the muscular parts of the human body suffer particularly from the saturnine poison, it may not be unworthy of our curiosity, and it is not foreign to our purpose, to enquire, in what manner they are affected by it.

OUR muscles, in general, when in perfect health, are large, firm, and of a purple colour, with a considerable degree of transparency. When the body becomes weakened by disease,

ease, the muscles generally become smaller and paler; more relaxed and flabby, with a tinge of a yellowish green; often entirely losing the purple colour. When a muscle is deprived of all power, or opportunity of acting, as in the case of palsy or of *anchylosis*, it then loses its colour and its size; but it becomes whiter, than in the former case: it is not so gelatinous or flabby: it still retains a transparency: and the muscular fibres become less distinct, as if steeped in a caustic alkali; while the other muscles, the action of which is preserved, retain their natural appearance. But those muscles, which are become paralytic, either in consequence of working with the *calces* of lead, or having the salts of that metal applied to them in the living body, suffer the following changes. They lose their size; they become dryer, or more tough; and their
fibrous

fibrous texture becomes more distinct, as in a boiled muscle; of a fine cream-colour, and perfectly opake. Mr. Hunter, who communicated to me these observations, informed me, that he saw an instance of what is above described in Saint George's hospital. An house-painter was received into that hospital, on account of a broken thigh-bone; and died in three weeks after the accident. Mr. Hunter particularly examined the muscles of the hand and arm; it having been observed, that those muscles, before death, were remarkably wasted. He found them all of a cream colour; entirely opake; their fibres very distinct; but dryer in their texture, and tougher than what is common. By this case he was induced to think, that all muscles, which have been for some time in a paralytic state, might put on these same appearances. But some experiments,

riments, which he has made upon dogs, incline him to an opinion, that those appearances are the peculiar effects of the poison of lead; and that muscles, which lose their action from other causes, appear very differently. For he found, that by an application of *saccharum Saturni* to the muscles of dogs, he, in a short time, could effect the same changes in them, which he had observed in the muscles of the painter above-mentioned.

It is well known, that quicksilver is often adulterated with lead; and it is as certain, that sufficient care is not always taken in its purification. It has even been observed, that the use of this substance, as a medicine, has sometimes been followed by the peculiar effects of saturnine preparations. It is therefore earnestly to be recommended to all, who apply quicksilver to the human body, to purify it by distillation.

XIV. *Am*

XIV. *An Attempt towards an historical account of that species of spasmodic colic, distinguished by the name of the colic of Poitou: By the same.*

Read at the COLLEGE, JULY 21, 1767.

PAulus Aegineta has been said to have been the first writer, who mentioned a species of colic, prevailing epidemically, and terminating in palsy, or in epilepsy. The testimony of this author is, “ that, in his time, “ there raged a certain colic, a new “ disease, which took its rise in “ Italy, and infested several parts of “ the Roman territory, κατὰ λοιμικήν τινὰ μετάδοσιν. In this disease, “ many became epileptic; and others “ suffered a loss of motion, the sense “ of feeling at the same time not “ being impaired. The greatest number
“ ber

“ber of those, who had convulsions,
 “died; but the paralytic patients,
 “for the most part, survived, as
 “if by means of the cause being
 “critically translated.” He adds,
 that; “many recovered their power of
 “motion in process of time; but
 “that others were cured with greater
 “difficulty.” (*See the third book*
of Paulus, chapter 18 and 43.)

THESE passages of Paulus we find
 referred to by Avicenna; who like-
 wise records, that the same species
 of colic had sometimes, in his own
 days, been epidemic. And, in an-
 other part of his book, he says more
 generally: “Paralyfis est crisis
 “colicæ; et multoties remanet sen-
 “sus; et qui evadit, evadit cum
 “paralyfi; et natura quasi illam
 “materiam expellit, et reducit ad
 “exteriora.”

BUT is it to be inferred from hence,
 that this species of colic was abso-
 lutely

lutely a new disease in the time of Paulus? Although he be the earliest author, who mentions it as epidemic, it cannot easily be allowed, that physicians, who lived before his time, had not taken notice of the same *phænomena* in particular patients.

At what time, and in what place, lead, which is undoubtedly a specific cause of this malady, was first known to mankind, we have no tradition: "Quis plumbum nigrum, et argentum vivum, et quo in loco invenit, non est memoriæ proditum." *Agricola de veteribus et novis metallis, lib. i.* However, the word *μόλυβδος* occurs in Homer; and we find Hippocrates, in several parts of his works, recommending the use of lead, and the *scoriae* of lead, as an epulotic application, and for other external purposes. Litharge of gold and cerusse enter the composition of powders, extolled by that author,

as of great efficacy in defluxions of the eyes. It is likewise remarkable, that long before the age of chemistry, we meet with exact directions for making several preparations of lead; and it is curious to observe, that the method of preparing cerusse, described even by so ancient an author as Theophrastus, nearly corresponds with the modern process.

BUT, how much soever saturnine preparations might have been used for external diseases, it does not appear, that the internal use of them was recommended by any of the ancient physicians. On the contrary, we find, that cerusse and litharge are ranked among poisons by Nicander, Dioscorides, Pliny, and Aëtius. And Paulus Aegineta ascribes the very same effects to the filings of lead, as to litharge. How careful Vitruvius and Galen were with respect to this poison, has been already men-

mentioned at large in a former dissertation.

NICANDER, the most ancient medical writer, next to Hippocrates, whose works are come down to us, has, in his *alexipharmaea*, given a very perfect description of the effects both of litharge, and of cerusse. Speaking of the former, he describes the colic, as the ordinary effect of that poison, in the following lines.

——— τότε γαστρί πύση βάρος, ἀμφὶ δὲ μέσσοι
 Πνεύματ' ἀνελίσσουσιν κατ' ὀμφάλιον βρομέουσιν,
 Οἷά περ εἰλίγιοι δυσαλθέος, ὅς τε δαμάζει
 * Ἄνδρας ἀπροσφάτοισιν ἐνιπλήσων ὀδύνησιν.
 Οὐ μὲν τῶν γ' ἔρων ἀνυλαί ρύσις· ἀμφὶ δὲ γυῖα
 Πίμπραλαι· αὐτὰρ περ μόλις εἰδήνατο χροῖν.

UNDER the article of cerusse, the same author mentions the paralytic affection, which is the common consequence of that, and every prepara-

* Dr. Bentley very ingeniously reads it—
 Ἄνδρας ἀπροφάτοισιν.

tion of lead, taken into the human stomach.

Ἄλλοτε δ' ὑπναλέος ψυχὴ δέμας, δόε τι γυνῆ
Ὡς τοπαρὸς δονεῖν, καμάτω δ' ὑποδάμναται, ἔκταν.

IF, therefore, Nicander, if Dioscorides, and the rest of the ancient writers, whose observations on such poisons agree with those made by Nicander, ever saw the effects which they so well describe, it follows, that they could not be unacquainted with the colic of Poitou. An inquiry into the diseases of miners must undoubtedly have furnished them with many instances of this species of colic. And indeed, it cannot be reasonably suspected, that Galen would, in several parts of his works, have shewn such an apprehension of the poison of lead, if he had not in his practice met with frequent examples of its most pernicious effects.

FRANCIS Citois, who, I believe, was the first writer, who called the
par-

particular species of spasmodic colic, which is the subject of our present examination, *the colic of Poitou*, first published his *diatriba de novo et populari apud Pictones, dolore colico bilioso*, in the year 1617; as appears in his dedication to his patron, the cardinal duke de Richlieu, prefixed to a collection of his treatises, called *opuscula medica*. Thuanus, in the fifty-fourth book of his *historia sui temporis*, makes mention of this disease, and of Citois as the original writer concerning it. What he says of it, however, is very little more than a literal transcript from that author. Indeed there is reason to doubt, whether what is said, in the histories of Thuanus, of the colic of Poitou, be not an interpolation of one of his editors. For Thuanus died in the year 1617, namely the very year, in which Citois first published his *diatriba*; and accordingly we find, that

the first notice, taken of the colic of Poitou by Thuanus, is in a posthumous edition of his work, published in the year 1639.

ACCORDING to Citois, the *dolor colicus Pictonicus* was a new epidemic disease, in the province of Poitou, about the year 1572; and, after having prevailed in that province about 60 or 70 years, it became milder, less untractable, and by degrees was translated to other parts of France. In the *appendix* to his *diatriba*, he expressly says, “Morbus iste, velut aves peregrinæ, alio nunc magna ex parte avolavit; et jam magis Aurelianenses, quam nostros Pictavenfes vexare dicitur.” And in his dissertation *de usu phlebotomiæ*, he has a chapter *de colico dolore bilioso apud Pictones NUPER populari*.

THUANUS fixes the precise time of it's continuance, agreeing with Citois, that

that it began in the year 1572:
 “ Per decennia recrudesceus, usque
 “ ad annum sextum sequentis seculi
 “ violentior semper incubuit.”

CIT01S, in his treatise on this subject, after having mentioned several new diseases, which had lately been used as the instruments of God's vengeance on a sinful world, such as *lues venerea*, *sudor anglicus*, *plica polonica*, and the scurvy, descends to the consideration of the disease in question; having first dropped an hint (seemingly to account for the *phenomenon*) that, to the great astonishment of astrologers, a new star, in the same year, had made its appearance in the constellation of Cassiopea. One cannot help taking notice of somewhat like a contradiction, or at least a want of precision in the history of the disease, as it is delivered by this author. “ It was unknown,” says he, “ from the time of Paulus,

“to that of Avicenna, a period of
“600 or 700 years; and, after hav-
“ing been unobserved for the space of
“full 500 years more, it revived,
“with the same, or even severer symp-
“toms, in the province of Poitou.”

And yet he had before not only as-
serted, that it had been very common
in all the province of la Guienne,
but had produced the testimony of
several authors to shew, that it had
long before been observed at Paris,
and in Picardy; and that moreover
Silesia, Moravia, and the greatest
part of lower Germany, had been too
well acquainted with this very cruel
disease.

But, in fact, the supposition that
the colic of Poitou was a new dis-
ease, about the time when Citois
lived, is so far from being well found-
ed, that it would not be difficult to
prove, by the testimony of authors,
the direct contrary to be true. For

instance, the disease was mentioned by our countryman John of Gaddesden; who appears to have written his *rosa anglica* early in the fourteenth century. Joannes Guinterius Andernacus, who published his translation of, and his commentaries on Paulus, in the year 1532, has the following note on that part of the eighteenth chapter of the third book of Paulus, where the epidemic colic is mentioned. “Quod Paulus suo
 “tempore accidisse in morbo colico
 “commemoratur, nos quoque nostra
 “aetate frequenter videmus; nempe
 “ex magno diuturnoque colico cru-
 “ciatu artuum resolutionem, præ-
 “sertim brachiorum, quanquam et
 “crurum imbecillitas summa adfu-
 “erit.” And Coiter, who, in the year 1553, published his *observa-
 tiones anatomicæ et chirurgicæ mis-
 cellaneæ*, testifies, that in Germany,
 and particularly in Franconia, and in
 the

the country about Nuremberg, this species of colic was, in his time, a frequent disease. Jacobus Oetheus, in the year 1609, gave a very accurate and circumstantial account of it. He affirms, that it was common in Franconia, in Austria, and particularly in the whole circle of Zwaabe. Paracelsus, who, in the midst of the most incomprehensible jargon, sometimes writes intelligibly, testifies, that “colica vel ex seipsa definit, vel tollitur remediis, vel terminatur in paralyfin.” There is, in the same author, another passage, which I shall transcribe, on account of the just observations on this disease, which it contains, “Colica est, cum dolor, ac tormentum in ventre oboritur, cum contractione ejus, et excrementorum suppressione, nisique aliis multis ratione stomachi et viscerum cæterorum fientibus. Postea malum transit in membra
I artusque,

“artusque, in quibus hærens manus
 “pedesque contrahit plus minus,
 “proüt morbus magnus, et materia
 “copiosa fuerit. Porro cum vi qua-
 “dam sese diffundit; et vel acuta
 “vel chronica evadit, proüt genera-
 “tionis ejus natura est. Tandem se-
 “quitur consumptio corporis, muta-
 “tio vocis, et totius substantiæ immi-
 “nutio.”

FROM these, and several other pas-
 sages, which occur in the writings
 of Paracelsus, it appears, that this
 man, who, early in the sixteenth
 century, wandered over Germany,
 France, and Switzerland, was per-
 fectly acquainted with the species of
 colic, which is now under our con-
 sideration. For he represents it ter-
 minating in palsy, and a consump-
 tion of the whole substance of the
 body.

BUT it may reasonably be made a
 question, whether Paracelsus, who
 was

was very fond of saturnine medicines, in many diseases, and whose particular doctrine it was, that "Saturnus purgat febres," did not contribute to render this colic more frequent, than otherwise it might have been. For, according to the testimony of Libavius, he often left his patients more diseased than he found them; and it is acknowledged by his disciple Oporinus, that, when he was sent for to any town, in order that he might administer his internal medicines, he was very seldom suffered to make a long stay in it, on account of the general resentment of the inhabitants against him.

If modern times had not furnished similar instances, it would have been matter of astonishment to us, to have heard that Erasmus, the friend, the correspondent, and the patient of our excellent Linacer, whose great skill in the science of physic he extols in several

several of his epistles, ever consulted, in his own case, so wild, so illiterate an enthusiast, as Paracelsus appears to have been. But it is to be lamented, that, in matters which relate to physic, even the most sensible part of mankind has ever shewn a degree of weakness, and credulity, easily imposed on by the self-importance of those, who know how to recommend themselves to the world by bold promises; and that diffidence, doubt, and hesitation, which help to constitute the true character of a philosopher, have ruined both the fame and fortune of many an excellent physician.

A GREAT number of other authors might be cited, who gave a full description of the colic of Poitou, before the time of Citois; so that he ought not by any means to be esteemed the original writer on this subject. And if we consult authors,
posterior

posterior to Citois, we find almost in every practical book this species of colic mentioned. We have an account in Sennertus, of it's having prevailed epidemically, all over Silesia, in the year 1621. Baglivi even affirms, that "nihil facilius colicæ supervenit, quam paralyfis." And Willis, in the pathological part of his treatise *de anima brutorum*, testifies that, "affectioni colicæ crebro et gravius obnoxii demum paralytici evadunt. Casus adeo frequens hic, ut morbi hujus successio inter illius prognostica habeatur; nam qui tormina in ventre, aut paroxysmos atrociores, per intervalla redeunt, pati solent, tandem in habitu corporis ac membris dolores vagos, deinde postea stupores, et denique non raro ἀναισθησία, sive resolutiones subeunt."

A reader, conversant only with books, and not having opportunities
of

of observing diseases in themselves, would be apt, from such general assertions, to conclude, that every colic pain, if violent, does ordinarily, and in the common course of nature, terminate in a paralytic affection. If this were really the case, it would follow, that Graßhuis has given a true definition of the colic of Poitou, in the following words: “ Colica
 “ *Pictorum* designat dolorem colicum atrocissimum simul et per-
 “ tinacissimum, ex quacunque causa
 “ oriundam.” (*Graßhuis de colica Pictorum tentamen, p. ii.*) But is it confirmed to us by experience, that every violent pain in the bowels has the same characteristic marks? Do we find, that the *ileus*, or that colic, which is produced by concretions of gall, sticking in the biliary ducts, terminates in palsy? Is palsy the *crisis* of that colic which arises from a gouty, or an hysterical cause? Those,

Those, who have attended the most accurately to nature, have made no such observation : and it seems only to be one species of colic, probably derived from one simple, uniform, specific cause, which has palsy and epilepsy for its pathognomonic symptoms.

PAULUS refers the cause of the colic, which he describes as epidemic in his time, to thin acrimonious humours. Citois, in considering the causes of the colic of Poitou, though he cursorily mentions several concurring causes, seems to lay the greatest stress on the sour, unripe, austere wine of that province. This degeneracy of the wine he attributes to the excessive violence of the North wind, which had prevailed for some years ; and to frosts, which had begun, before the autumn had been nearly ended ; and which had continued until the spring had been far advanced. This opinion he confirms by an observation,

observation, that the mendicant friars of all orders, who were obliged to drink the very worst wines, were more particularly subject to the colic. He gives an history of thirteen friars of the order of Saint Bernard, belonging to the abbey Noaille, who were most severely tortured by this disease; for that, having before been accustomed to drink the good and wholesome wines of Languedoc, they had been reduced to the necessity of drinking the wines of Poitou, "which were," says he, "white wines, very unripe." These religious men, being removed to other provinces, speedily recovered their health.

ACCORDING to Citois, this disease was more frequent in autumn, than in any other season; more severe to women, than men (though women were less frequently attacked by it); to the old, than young; to foreign-

ers, than natives; in winter, than in summer.

If we examine the writers, who lived before Citois, as well as those, who followed him, we find a general suspicion prevailing, that the mischief was done by some noxious quality in wine. Here and there we find an adulteration suspected; but the greatest number of writers, copying one the other, have referred the mischief to the wine itself; some, on account of its strength and sweetness; others, on account of its acidity. Crato (*consil. med.* 10.) giving his advice to a patient, subject to this colic, says, “vinum omne suspectum;” “imprimis autem moravica noxia” “sunt, et nativum quiddam, quod” “hunc morbum conciliat, in se continent. Hinc tot colicos et paralyticos in Moravia videmus. Nec” “ab hac malitia absunt austriaca,” “nisi bene atque sæpe sint elutriata.” “Dulcia,

“Dulcia, crassa, et turbida plurimum
 “nocent; rhenensia pura, matura,
 “*non contaminata hominum fraude,*
 “innocentissima sunt.” Wepfer, in
 the *annus secundus* of the *ephemerides germanicæ*, has given a dissertation on the subject of *parefis post colicam ex vino*. “Patients,” says he,
 “labouring under a bilious colic,
 “which is apt to end in palsy, give
 “me great trouble; but this happens
 “abroad, rather than at home. For
 “the people of Swisserland general-
 “ly drink red wine, well ripened,
 “and generous. If any person, by
 “chance, happens to be affected by
 “a colic in the country about Scaf-
 “hausen, he never, to my know-
 “ledge, becomes paralytic; nor can
 “I find that this has ever been the
 “case hereabouts, having examined
 “the medical annals of one hundred
 “years past. The people of this
 “country are subject neither to the

"gout, the stone, nor convulsions.
 "I have hitherto ascribed such an
 "exemption from these diseases to
 "their drinking our wholesome red
 "wines. On the contrary, where
 "white wines are drunk, this species
 "of colic is very frequent; viz. in
 "Alsace, near the lac de Zell, and
 "in the duchy of Wirtemberg.
 "There are likewise in those parts
 "a greater number of gouty and
 "nephritic patients; and people of
 "both sexes are more liable to con-
 "vulsions. There is a monastery near
 "us, where the fathers drink no
 "other than white wine. Scarce one
 "of them escapes the attacks of this
 "colic. Not long ago several do-
 "minican friars were affected by this
 "disease, after drinking the wine of
 "Alsace: and, convulsions coming
 "on, they were all killed by it. I
 "have suspected the cause to have
 "been the *tænia sulphurata dulcis*,
 "that

“ that is, bismuth mixed with sulphur applied to the fumigation of wine. The same cause had formerly been suspected by Thomas Jordanus, as the source of this disease in Moravia; on account of a supposed similitude in the effects of bismuth, and lead.”

It seems wonderful to find, how very little, physicians, even of the first reputation, formerly knew of the deleterious qualities of lead. Fernelius, who published his *universa medicina* in the year 1592, although, in his seventh chapter *de luis venereae curatione*, he describes most terrible effects of the powder of lead, given, in the quantity of a pound and half, in the space of fifteen days, to his friend, as a remedy against the gout; (which effects he attributes to the hidden and inexplicable malignity of that metal; and concludes from that case, that lead ought never

to be taken into the body) in the very same page, when he describes the true colic of Poitou, in the case of a painter of Anjou, in the year 1557, plainly shews, that neither he, nor any of the other physicians concerned, understood the true cause of the disease. He supposes it to have been occasioned by cinnabar mixed in the painter's colours; and seems to treat his brethren very contemptuously, for having differed from him in their judgment; some of them having suspected the *pituita vitrea*, and others the acrimony of the bile, to be the cause of the disease.

WHEREVER indeed we turn our eyes among books, we find very great marks of ignorance concerning this subject. Ramazzini, who professeth to have inquired accurately into the causes of those diseases, to which the various artificers are subject,

ject, wonders extremely how it should happen, that, since lead furnisheth us with excellent remedies, for internal, as well as external purposes, the potters should suffer so cruelly from the exhalation of this metal, in doing their work. (*Ramazzinus de figulorum morbis.*) But in fact, writers of much greater accuracy and correctness, than Ramazzini, have given instances of a similar inattention on this subject.

THE almost general silence of old authors, particularly of the German physicians, with respect to the adulterations of wines, is not easily accounted for. We find, that, in the year 1487, there was a *recessus imperii* promulged at Rotenberg; and, in the year 1498, at Friberg; which was enacted, in the year 1500, at Tübingen; and, in the year 1508, at Frankfort; and, in the year 1577, in the same place; by which decrees

it was made a capital crime to adulterate wines with litharge, or to use bismuth in the fumigation of them; it having been, at several periods, represented to the Emperors, that great mischief had been done by such mixtures; and that they had been the cause of insuperable and mortal diseases. It should seem, that these laws were not carried into strict execution; and indeed that, in the latter end of the last century, it was hardly known in Germany that any such laws subsisted; or, at least, that they were regarded as antiquated laws; and that the principles, on which they had been enacted, were wholly forgotten. For, in the *ephe-merides germanicæ*, we find, about the latter end of the last century, the physicians taking pains in inquiring into the cause of an epidemic colic, which had for some time prevailed in various parts of Germany, more especially

especially in the duchy of Wirtemberg. Many causes were suspected, particularly the culinary vessels, on account of copper; which vessels were therefore ordered to be carefully lined with tin. But the disease still continued; and, no cause having been discovered, at length it was imputed to witchcraft. After many fruitless conjectures, it was plainly found out, on what this epidemic disease had really depended. The vintners, in order to correct their sour, austere wines, and make them palatable, had practised a method of mixing litharge with them. Among some, we find, it was the custom to throw into their casks litharge in substance. Others first impregnated vinegar with litharge; and then added this vinegar to their wines in a certain proportion. The method, and the proportion, are described by Cockelius in the thirtieth observa-

observation of the *annus quartus* of the *ephemerides germanicae*. The ninety-second observation of the same year, by Brunnerus, is on the same subject; and the hundredth observation, of the same year, by * Vicarius, contains several curious particulars concerning the discovered adulteration, and its effects on the human body. Reiselius, in the 251st observation of the *annus quintus et sextus*, has more on the same subject. A representation of these facts having been made to the duke of Wirtemberg, by a decree, bearing date March 10, 1696, it was made a capital crime to mix litharge with wine, or even to sell litharge in the shops. But notwithstanding the severity of this law, we are informed

* This author supposes this method of adulteration to have been a modern fraud; but he acknowledges that he had been informed by the elder Wepfer, that the same fraud had formerly been practised on beer which had turned sour.

by

by Zeller, that, in the year 1705, the same dangerous experiments were repeted in the circle of Zwaabe, with a view to correct the acidity of the weaker wines. And it is certain, that in France, as well as in Germany, the same adulteration is practised even at this day, in defiance of laws, and in opposition to the dictates of humanity.

I do not undertake to demonstrate, that the same frauds were practised formerly on the wines of Poitou; and that from thence was derived the real cause of the disease, described by Citois. But if we take into our consideration what is said of the *vina pictavensia alba*, by Hoffmann, that “multum conveniunt
“cum rhenanis, tantum in eo inferi-
“ora hisce, quod sint crudiora;” and that therefore such crude wines were likely subjects of such adulteration; if we reflect, that, the art of im-
proving

proving wine, by a mixture of litharge, had been practised and prohibited in Germany, many years before the time of Citois; if we take into our account likewise, what seems more than probable, that the farmers of Poitou might have endeavoured to make their wines less acid, by a decoction of their Must; and if we compare the genuine effects of the adulterated wine of the duchy of Wirtemberg with the description of the *dolor colicus pictonicus*, described by Citois; from a very remarkable similarity of circumstances, and of effects, we may perhaps be led to conjecture, that the colic of Poitou, and of the duchy of Wirtemberg, were produced by one and the same cause.

UPON the same principles, perhaps, we may be enabled to assign a probable reason, why this disease was much less frequent among the
Ancients,

Ancients, than it has been in more modern times.

THE Ancients, in manufacturing their wines (which they seem to have done in an unskilful manner) made use of various *condimenta*; with a view to bring them sooner to maturity; to take off their ropiness; to correct their acidity; and, in general, to improve their colour, their smell, and their taste. The substances, applied by them to these uses, appear to have been innocent. Pliny, however, intimates, that the people of the *Narbonensis Gallia* (one of the four quarters of ancient Gaul, which contained Savoy, Dauphiné, Languedoc, and Provence) had secret and pernicious methods of adulterating their wines; and that they “*officinam ejus rei fecere, tingentes fumo, utinamque non et herbis et medicamentis noxiis.*” But there seems to be no reason to imagine, that

that any of the ancients ever made this use of litharge. Nor indeed, being under such apprehensions of it's poisonous qualities, would they probably have dared to have mixed this substance with their liquor, even if they had been acquainted with it's power of correcting acidity, and of communicating to the crude wines a finer colour, and more generous flavour.

HOWEVER, if we inquire into the method of treating the wines, of inferior note, practised by the ancients, we find reason to conclude, that the liquor, thus treated, could not be entirely free from a solution of lead.

It cannot easily be ascertained, at what time the method of boiling the unfermented juice of the grape was first introduced. In reading the ancient poets, we meet with very frequent allusions to such a custom; and some of the Roman authors, who

who have professedly written *de re rustica*, have given particular directions, concerning the method of conducting this process. Several likewise of the Greeks, as we are informed by Pliny, namely Euphronius, Aristomachus, Coniades, and Hicesius, had published precepts on the same subject.

ACCORDING to the rules, given by Columella, the Must was to be boiled down, until a fourth, or a third, or more, was consumed; and then, several ingredients having been added to it, was generally set apart for a year, as a medicament, to be mixed with wines, as occasion might require, with a view either to preserve them to a great age, or to cure them, when they were suspected to be in danger of turning sour. Palladius distinguishes this inspissated Must into three sorts; to which he gives different names. The first sort he calls simply *defrutum*; “ubi ad spissitudinem

“*dinem fortiter despumaverit;*” the second sort, *carænum*; “*cum tertia perdita, duæ partes remanserint;*” the third, *sapa*; “*ubi ad tertias redacta descenderit.*” (*Palladii October, Tit. xviii.*) Columella sometimes seems to make a distinction between *defrutum* and *sapa*; but often uses them indifferently as synonymous terms. But, strictly speaking, they are different; * *sapa* being *defrutum* reduced to the consistence of a syrup; or, according to Virgil's expression, *igni multo pingue*.

It was usual to add a certain proportion of this boiled Must to each *amphora* of the new wine, which required to be medicated; more or less according to it's strength. Some

* The *sapa* is still used in Italy, and is kept in bottles, in order to be put into sallads, and some sorts of sauces. At Naples, it is called *musto cotto*; but in Tuscany, it retains it's old name, *sapa*; and there, as formerly, they mix with it spices, and other ingredients.

farmers,

farmers, as Columella informs us, mixed with their new wine one fourth part of *defrutum*. This they were obliged to do on account of the weakness of their wine; which, according to Columella, could not otherwise have been kept sound thirty days.

BUT it is very remarkable, that leaden vessels are, by several ancient authors, mentioned as proper for the preparation of this *defrutum*. We find in M. Cato (*de re rustica*, cap. cvi.) the following directions for making greek wine, at a distance from the sea. “ Vinum græcum sic facito. “ Musti quadrantalia xx in aheneum, aut plumbeum infundito. “ Ignem subdito.” And again, in cap. cvii, “ sapæ congios vj quam “ optime infundito in aheneum, aut “ plumbeum.” But Columella (*de re rustica*, lib. xii. cap. xx.) expressly orders, that the *vasa defru-*

taria should be leaden, and not of copper, for this reason ; because copper vessels are apt to communicate to the preparation a taste of verdigrise. “ *Ipsa vasa, quibus sapa aut* “ *defrutum coquitur, plumbea potius quam ænea esse debent ; nam* “ *in coctura æruginem remittunt æ-* “ *nea.*” The same directions are given by Pliny ; who orders absolutely, that the *defruta* and *sapæ* should be prepared “ *plumbeis vasis, non æ-* “ *neis.*”

It is observable, that particular directions are given by Columella, that this decoction should be performed in a cautious manner ; and that he recommends a particular attention “ *ne plumbeum perforetur.*” And, in order to prevent a perforation of the lead, he advises, that the first part of the process be performed by a gentle fire. He advises, likewise, that the person, to whose care the
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the decoction of the Must is committed, during the whole time of its boiling, stir the liquor continually, in order to prevent any thing sticking to the bottom, which may endanger the vessel. When the vessel can bear a stronger heat, that is, when the ebullition begins (*cum aliqua jam parte mustum excoctum in se fervebit*) he directs that a larger fire be made, care being taken that the vessel do not come in contact with the fuel. "If this be not avoided," says he, "either the vessel will be melted; or, if that does not happen, the Must will be burnt, and contract a bitter taste."

It will hardly be doubted, but that the juice of the grape, thus evaporated in leaden vessels, must have dissolved some of the metal; and it should seem, that the wine, manufactured in the manner above described, must have been prejudicial to those, who

drank it, in proportion to the quantity of *defrutum* or *sapa* mixed with it. Pliny, therefore, had probably found reason for making so severe an animadversion on wine in general. "Tot veneficiis placere cogitur; et miramur noxium esse?" *C. Plinii Secundi naturalis historiae, lib. xiv. cap. xx.*

HERE then a cause is discovered, which may reasonably be supposed to have sometimes occasioned the colic of Poitou, among the ancients. But it is really astonishing to find, that, notwithstanding all that had been written against lead, and its preparations, not only a popular practice, of boiling this liquor in leaden vessels, should so long have prevailed; but that such a practice should stand approved and recommended in the work of a philosopher. Is it not probable, that Columella (who, in several passages in his book, appears

to

to have been in the interest of the farmers, and a friend * to adulterations) had learned by experience, that a peculiar advantage was gained by boiling Must in lead; and that the *defrutum*, in this manner prepared, had a particular efficacy in preventing, or in suppressing the acetous fermentation in the weaker wines? Indeed it seems likely, that the farmers themselves were not unacquainted with the operation of acids on lead; since it appears to have been a common experiment among them to put a plate of lead into a cask of wine, in order to determine, whether or not the liquor was inclined to be sour. “In vitium inclinantis experimentum est lamina plumbea:

* “Cavendum est, ne conditus sapor intelligatur: nam ea res emptorem fugat.” *Columella in l. xii. c. xx.* “Cura adhibenda, ut Mustum perenne sit, aut saltem usque ad venditionem durable.” *Idem in l. xii. c. xix.*

“mutatur in ea color.” (*Plin. nat. hist. lib. xiv. cap. xx.*)

BUT, in general, if we inquire into the chances, which the ancients had of being injured in their health by means of the poison of lead, we find them to have been much fewer, than mankind, in more modern times, has incurred; and it appears that such chances have been multiplied among us, in proportion as improvements in several articles of convenience and luxury have been introduced.

RAMAZZINI informs us, “artificium fictilia vitreandi antiquissimum fuisse, uti ex erutis e terræ visceribus constat.” If, by the words *artificium vitreandi*, Ramazzini meant the art of glazing the earthen ware, according to the present method, principally by the means of a preparation of lead, he probably was mistaken. The art of forming clay into vessels seems to have been one of the earliest

earliest inventions of man; but this method of covering the surfaces of such vessels, I conjecture to be a modern improvement, which the world was not acquainted with, before the age of chemistry. That part of the old earthen ware, preserved in the British Museum, which is supposed to have been of Roman manufacture, is not glazed. Those vessels, which are called Etruscan, and which are supposed to be of greater antiquity than the Roman, have indeed a paint or polish on their surfaces; but that does not appear to resemble our modern saturnine vitrification.

IF then the ancients were ignorant of this art, it seems probable, that their ignorance, in this instance, contributed its part towards securing them from the colic of Poitou. For it has been already observed, that lead, in its vitreous state, is very soluble by acids. And it is well

A a 4 known,

known, that potters, who are exposed to the vapours of this metal, while the process of glazing is performed, are particularly subject to that disease.

ADD to this consideration, that the quantity of cerusse, used by the ancients, must have fallen infinitely short of the present consumption of it; that they were wholly ignorant of various arts and manufactures, in which lead is now used; and that it is not proved by any authority, that they ever administered saturnine preparations, as internal remedies. A comparison of the various fashions and customs, and of the various modes of luxury, which prevailed among the ancients, with those, which now prevail, would suggest to us many other probable causes, why this disease, which at present occurs to our observation almost every day, was not so frequent in past ages. To
examine

examine minutely the several parts of such a comparison, would be a curious and an entertaining inquiry.

It would be vain to conjecture, by what means this disease became so general in the days of Paulus Aegineta; since neither he, nor any of his contemporary writers, have left materials, on which a probable supposition, concerning this subject, can be founded. But Avicenna (between whose time and that of Paulus no author is supposed to have described this colic) informs us, by what means it may reasonably be suspected to have infested his contemporaries. For he testifies, that the women used litharge as a domestic remedy for their children; and that it was a common practice to put litharge into water, when it was suspected of being unwholesome. His words are,
 “ Mulieres nostrates propinant lithar-
 “ gyrium pueris, adversus alvi flux-
 “ um,

“um, et ulcera intestinorum. Eadem
“subinde ipsum poculis aquæ inji-
“ciunt, ut vis aquæ noxia obtunda-
“tur.” He, however, calls litharge
“lethale medicamentum, urinam
“sistens, ventrem et ureteres inflans,
“et distendens, respirationem coar-
“cans.” I find no earlier account,
than this, of lead having been used as
an internal remedy even by women,
or by empirics. And it seems proba-
ble, that from such practitioners the
internal use of it, as a medicine, was
originally borrowed; and that it was
by degrees introduced into pharma-
copœias, and the legitimate practice
of physicians.

FROM what has been premised, it
appears, that, in the earlier ages of
the world, the colic of Poitou, al-
though not unknown, was not a fre-
quent disease; that it was originally
described by authors of great antiqui-
ty, as the ordinary effect of the poi-
son

son of lead; and that, during a course of many years, it was no otherwise mentioned in books, than as the effect of that poison. It appears likewise, that, as luxury and refinement, and fraud, increased in the world, this poison had more frequent opportunities of exerting its virulence on the human body; and that therefore the disorder by degrees became more and more common. I am sorry likewise to add, that there appears to be abundant reason to suspect, that the art of medicine itself has contributed its part towards propagating this colic, by borrowing from the class of poisons a substance, which, however efficacious it may have been in some violent complaints, has not hitherto been convertible into a safe remedy.

XV. *An examination of the several causes, to which the colic of Poitou has been attributed: By the same.*

Read at the COLLEGE, August 7, 1767.

THE eighth and ninth volumes of *la bibliotheque raisonnée*, published in the year 1732, contain a long dissertation concerning the colic of Poitou. In the year 1757, there appeared a Latin treatise on the same subject, written by a physician of distinguished reputation. These two pieces, besides other marks of resemblance between them, agree very much with respect to the remote causes, to which this disease is referred, in both. This induced M. Poissonier Desperrieres, in his letter, inserted in *le journal des sçavans*, for the month of February, 1758, to imagine, that both treatises were written
by

by the same author. But it appears, that the dissertation, which is in *la bibliotheque raisonnée*, was the composition of M. Massuet.

IN examining the several supposed causes, to which this disease has been attributed, I propose to follow the order, which is observed in the Latin treatise above-mentioned; and I shall hope to be excused by the learned author, if, after having impartially considered the doctrine, I find myself in no degree convinced by the general reasoning contained in his book.

THE first cause, here mentioned, is “the remains of fevers, the crisis of which has been imperfect; or which have not been properly treated.”

THE author, in order to establish this, as a practical observation, first appeals to the testimony of several writers. But it is to be remarked, “that

that Fernelius, who is the first writer cited, although he does observe, that a colic is apt to succeed tedious fevers, particularly those of a bilious kind, does not here assert, that such fevers are followed by a colic, the nature of which is to terminate in palsy. And indeed, if it can be shewn, that, in any part of his *universa medicina*, he has made such an assertion, nothing more will be proved by a quotation from Fernelius, than that such was the opinion of a very fallible writer.

BALLONIUS, who is next introduced as having made a similar observation, testifies, that he found this consequence of a fever particularly in those patients, who, tired of their disease, and desirous at once to extinguish the flame, had recourse to the assistance of women and empirics. What instruments such practitioners made use of in the time of

Ballonius, it will be obvious for any person to conjecture, who knows how much several preparations of lead have been extolled by women and empirics, on account of their supposed febrifuge power. Indeed, it was not only the doctrine of Paracelsus, and the other empirics of former times, that "Saturnus purgat febres;" but even physicians, of the first class, have spoken of lead with very high praises of its efficacy in curing fevers. We find Pitcairn, in his *elementa medicinae*, placing sugar of lead among *remedia rarefcentiam nimiam sedantia*. It is by this author ranked with purified nitre, spirit of sulphur, juice of lemons, distilled vinegar, emulsions of the four greater cold seeds, and *vesicantia*. It was common to give to a patient one scruple of sugar of lead immediately before the expected time of the paroxysm of a quartan fever.

And

And there was a certain preparation of lead, called *butyrum bezoardicum saturninum*, which was greatly trusted to in malignant fevers. Nay Etzlerus was so fond of lead in all diseases, both acute and chronic, as to have made use of the following very strong expression in recommendation of it's virtues: "ex eo conficiuntur medicamenta facientia ad longævitatē."

A CASE is afterwards cited by our author from Carolus Piso, of a young man, who from a tertian fever fell into a quotidian, attended with colic pains; which, after having continued forty days, were succeeded by palsy in the arm, and afterwards by convulsions, and death. But it is worthy of notice, that Carolus Piso, in the same page, mentions the termination of a colic in palsy as a common occurrence; and that he appeals to an observation, made by his

his father, Nicholas Pifo, that, in the province of Lorraine, such a species of colic was particularly endemial; that the inhabitants likewise of Melun were very subject to it; and that it would be tedious to enumerate singly all the patients, whom he had seen thus affected.

WE are informed by the same author, Carolus Pifo, that he had visited two convents; one in the year 1596; the other, seven years after that time; and that, in both houses, he had found the monks most miserably affected, some with colic pains; others with palsy of their arms, which hung useless from their shoulders; others frequently harrassed with convulsions; others in a lethargic state. He does indeed mention (probably to save his theory) that they had some degree of fever; but that, to use his own words, was *valde mediocris*. His notion was, that the

disease, which he found so common in those monasteries, was apt sometimes to succeed the declension of tertian fevers; and that, at other times, it was complicated with tertian fevers. But, in the preceding paragraph, he seems to have approached much nearer to the true cause; when he mentions the free manner of living, which he observed among the seniors of the convent, who are said to have been the only persons in it, who suffered by this disease; for the junior monks, who were kept under restraint, and to whom very little or no wine was allowed, enjoyed perfect health, free both from fever and colic.

To the testimony of several other writers, which tend to prove no more, than those testimonies, which have already been examined, the author adds the result of his own experience. And he here asserts, that the

the bilious fever, which, in the year 1727, raged at Amsterdam, being suppressed by the use of the peruvian bark, given while the putrid bile was turgid, violently affected the mesentery, and membranes of the intestines; and that the presence of the colic of Poitou was a proof that the bilious fever had preceded; the remains of which fever, having continued several years, had made that species of colic familiar to the physicians of Amsterdam. If we turn to another part of this work, we find a very different reason given, why this disease was common at Amsterdam. It is there referred to rain-water impregnated with the lead of the roofs of the houses. "Et hæc est ratio, quare insolitus olim, colicus dolor grassetur nunc Amstelodami."

ETTMULLER, in the twenty-sixth case of his *collegium consultatorium*, relates the following history. A per-

son, who laboured under a double quartan fever, had, by the advice of his physicians, taken the powder of the peruvian bark, by which the paroxysms had several times been prevented; but still the fever had afterwards returned. Ettmuller, having found other medicines ineffectual, gave his patient, on the days when he expected the paroxysm, eighteen grains of sugar of lead, in two doses; by which medicine, repeated several times, the fever was at length subdued. Hereupon followed an obstinate constipation of the bowels, together with a convulsive colic: Some medicines, which the physician administered, relieved these disorders; but nevertheless, for some time afterwards, at the usual hour of the paroxysm, he suffered returns of a periodical colic. The author accounts for this effect, by supposing that the febrile ferment had been prematurely fixed

fixed and concentrated by the sugar of lead. Had the circumstance of the administration of sugar of lead been omitted in this history, how plausibly might it have been urged in support of a theory, which experience has not hitherto established!

POISONS are the second of the supposed causes of this disease.

THAT the poison of lead is capable of producing the colic of Poitou, is an obvious truth, which can admit of no controversy. But let us see, whether or not there be any reason for a commonly received opinion, that other metals have a similar power. Our author supports such an opinion; and appeals to the authority of Joh. Jac. Scheuchzerus, in order to prove, that the same effects may be produced by copper. Scheuchzerus, in his *itinerarium alpinum*, it. i. ann. 1702, p. 17, speaks of a monastery, the inhabitants of which

were almost universally seized with a spasmodic colic, which terminated in palsy. The water of this monastery is said to have been pure; and the wine not to have been adulterated with litharge, or any other poison. But it appeared, that the culinary vessels, used for the purpose either of preparing or of keeping the victuals, were all made of copper; and that the tin, with which they had been lined, was worn off. And hence it was concluded, that copper had been the cause of this malady.

It is certain, that copper is soluble by all acids; by alkalies both fixed and volatile; by the neutral saline liquors; and by oils; and that even common water, suffered to stand long in vessels of copper, extracts so much of it, as to gain a taste of the metal. But the constant effect of any small quantity of verdigrise, or vitriol of copper, taken
into

into the stomach, is immediate on the stomach itself, and on the intestines. Neuumann knew a person, who, having accidentally swallowed a sleeve-button of brass, was seized with violent disorders in the first passages, and died in agonies. Vehement vomitings, and even convulsions, have been excited in children by the *unguentum aegyptiacum*, the basis of which is verdigrise, applied to ulcers of the mouth; some of the ointment having been accidentally swallowed. Small doses of the blue vitriol have frequently been administered, as a remedy in intermitting fevers, and in epilepsies. Several cases are mentioned, which have thus been successfully treated; the medicine having acted as a powerful emetic. But I do not hear of any experiments, which tend to prove, that the preparations of copper are productive of the colic of Poitou. It

is therefore most reasonable to conclude, that that metal was unjustly suspected by Scheuchzerus.

ANTIMONY has likewise been condemned, as productive of this species of colic; and our author adds to an history, cited from Mercurialis, a case, which fell under his own observation, tending to shew, that antimony had really been the cause of this colic. A sea-surgeon, who had, for several weeks, taken some grains of crude antimony, every day, was seized with a colic, which ended in a paralytic affection of his hands and feet. It has been the fate of this substance very frequently to incur the suspicion of being poisonous. It was proscribed by a decree of the faculty of physick at Paris, followed by an *arrêt du parlement*, in the year 1556. Paulmier de Caen, physician at Paris, was degraded in 1609, for having given antimony; which, however,

ever, in 1637, was by the faculty classed among remedies, in a book published under their authority. At length, in 1666, the decree and arrêt were revoked. But here we find antimony again arraigned, after having long had the character of an innocent ineffective medicine. Probably the truth was, either that the sea-surgeon, whose case is mentioned, had taken the native mineral; which, having not been purified, might contain some particles of lead ore; (for this is said to be the case of the English antimony in general) or, what is a more likely supposition, that the disease owed its origin to another unsuspected accident.

NOR is there any foundation for us to imagine, that this disease was ever occasioned, as has been supposed, by the *effluvia* of antimony in the mines. We are informed that the ordinary effects of antimonial *effluvia* are suffocation,

cation, apoplexy, vomiting, *diarrhœa*, loosening of the teeth, and salivation: —very different effects from those, to which persons are subject, who inspire the exhalations of lead. Salivation, mentioned by Siemens in his dissertation *de metallurgia morbifica*, as having been often raised by the fumes of antimony, has been generally regarded as the specific operation of mercury only. But Dr. James lately informed me, that, for sixteen years last past, his fever-powder has contained no mercury; and yet that, within that space of time, he has known at least six instances of a salivation raised by his medicine. He added, that the patients, who were thus salivated, had neither their teeth loosened, nor their breath made offensive; as happens in a mercurial ptyalism.

It has been likewise supposed, that the fumes of mercury are productive of this colic. Having made a particular

cular enquiry, concerning this fact, among the gilders on copper and silver, I find, that they, who stand over the fire, while the mercury evaporates, are, in general, pale and cachectic; that they are much affected with tremors and debility, particularly in their hands; and that, when the disease is confirmed, like patients labouring under the *chorea sancti Viti*, they have no command over the muscles, which naturally obey the will. It is denied, that, in general, these artists are subject to colic or costiveness. But if they sometimes suffer pains in their bowels; nay if it even can be proved, that a gilder, on copper or silver, has now and then been affected with the colic of Poitou; may not such an effect very reasonably be imputed to the poison of lead, with which mercury is known to be frequently adulterated?

THOSE, who work in the mines of quicksilver, ordinarily suffer diseases, similar to what we observe in gilders on copper and silver. Fallopius, in his treatise on metals and fossils, informs us, that these miners hardly ever live three years; and Ettmuller, in his *mineralogia*, testifies, that they fall into tremors of their limbs; and that they are affected with asthma, and vertigo, and palsy. Ilsemann, in his dissertation *de colica saturnina*, insists, that, unless we use the term *mercury* in the sense in which it was used by Paracelsus, and understand by it every thing which arises in form of smoke from mineral substances, there can be no reason to attribute the colic of Poitou to mercury. "It cannot," says he, "be suspected of being the cause of it among our miners; it being well known, that quicksilver is not, in Germany, found in the mines of other metals. But

“ the effects of the vapour of quick-
 “ silver differ widely from this dis-
 “ ease. Adficiuntur hydrargyri ef-
 “ fluvia qui hauserunt, lipothymia,
 “ sudore frigido, convulsionibus,
 “ ἀναισθησία, apoplexia, epilepsia, et
 “ præsertim artuum tremore, paralyfi,
 “ ptyalismò, et dentium vacillatione.
 “ Respondere quidem nonnulla ho-
 “ rum, quæ enarravimus, symptoma-
 “ tum morbi nostri indoli primo
 “ intuitu videbuntur; ast curatius
 “ rem si perpenderit, differentia
 “ eorum haud difficile adparebit.
 “ Quæ enim ab hausto mercurio oriri
 “ solent convulsiones, paralyfes, fu-
 “ dores frigidi, lipothymia, ex idio-
 “ pathia, absque prægressis graviori-
 “ bus malis, ægros infestant; cum e
 “ contra eadem morbum nostrum
 “ symptomaticæ, præcedentibus nimi-
 “ rum ventriculi et intestinorum do-
 “ loribus, a mercurii vapore minime
 “ oriri solitis, subsequantur.

WE cannot wonder at Dioscorides, who in his earlier time, asserted, ὕδραργυρον ποθεῖσαν τὰ αὐτὰ ἐπιφέρειν τῇ λιθαργύρῳ but we could hardly find an excuse for one, who should, in the present age of experiment, content himself with subscribing to such an opinion, without giving himself the trouble of a more particular examination.

M. DU Bois, in his *thesis*, intituled, *non ergo colicis figulis venæ sectio*, seems to be confirmed in an opinion, that all the metals, and many other fossil substances, are capable of exciting this same species of colic. “Æris,
 “plumbi, stanni, argenti atque auri
 “fabris eadem impendet lucri pœna.
 “Simili causa, parique modo plec-
 “tuntur, qui crystallo, speculis, mar-
 “mori, gemmis aut cædendis aut
 “poliendis operam navant.” To this I shall only reply, that since M. du Bois has ascribed the very same effects
 to

to such a multiplicity of causes, contrary to the general observation of others, it should seem not unreasonable to conclude, that many of the twelve hundred patients, whom, in the space of twenty-three years, this physician attended in the hospital of *la charité*, with so inconsiderable a loss, were not really affected with the genuine colic of Poitou.

WHAT relates to the third supposed remote cause, namely, *the abuse of wine, and of other sour and austere fermented liquors, and of unripe acids*, has been sufficiently considered in an enquiry concerning the cause of the endemial colic of Devonshire. Nor does it seem necessary, in this place, to enter afresh into a discussion of that subject.

THE fourth of the remote causes, mentioned in this Latin treatise, is the gout and rheumatism.

PERHAPS there may be some reason to think, that a disposition to the
gout,

gout, which seems to be a disease of the spasmodic kind, may be increased by the same cause, on which this species of spasmodic colic depends. However this may be, it is very certain, that pains in the limbs are constant symptoms of the colic of Poitou. These pains are generally antecedent to the paralytic affection; and, as well as the colic itself, are apt to cease, and to return again at intervals. They sometimes, though rarely, fix for a short time in a particular limb; there bring on a slight inflammation, and personate the gout. A remarkable connexion, or sympathy, subsisting between the bowels and the limbs, has very frequently been observed. A person shall suffer pains in his intestines, in consequence of being wet in his feet. A dysentery, injudiciously treated, shall be changed into a rheumatism. Dr. Akenfide saw, in St. Thomas's hospital, so many

many instances of a translation of disease from the limbs to the bowels, and *vice versa*, that he is induced to call a species of dysentery, unattended with fever, which he describes in his *commentarius de dysenteria*, a *rheumatism* of the intestines.

BUT, although it be not denied, that the gout and the rheumatism do sometimes quit their proper station, and attack the stomach and intestines; yet experience by no means testifies, that palsy is the ordinary consequence of such an attack. A pain in the bowels, arising from a gouty cause, under proper management, generally returns to the extremities; which are very apt, for some time afterwards, to be swollen, and weakened. But a paralytic affection is not the usual termination of an arthritic colic. That *paralysis*, to which gouty people are subject, as far as I have observed, at-

tacks them in form of an *hemiplegia*, a disease very unlike that, which is the subject of our present consideration, in many particulars.

Our author gives, under this head, an account of a whole family, consisting of five persons, who were all first seized with arthritic pains, and then with a colic, which was succeeded by a palsy. Two of this number died. There is a circumstance in this history, which appears extraordinary. A lady is said to have been affected with all the symptoms above-mentioned, by the means of having slept in the same bed with her sick husband. And we are informed, that there have been many instances of this malady's having been communicated from the husband to the wife, and from the wife to the husband; and that, "*concubare vetant visa.*" But surely, it is much more probable, that five people, living under the
same

same roof, were affected by the same poison, conveyed in their food and liquor; than that the gout, palsy, and colic, were propagated through the family by contagion. For what reason can be given, why contagion was to be supposed to have prevailed in the present case, rather than in the case of the eleven persons, of the same family, mentioned in page 67, whom the author represents as miserably tormented by the colic of Poitou, from one common cause, which he satisfactorily explains? We are there informed, that all the eleven patients, “mutato tecto, renovata aqua, convalescere.”

Obstructed perspiration is the fifth of the remote causes, to which this disease is referred.

EVER since Sanctorius published his statical experiments, the importance of the fluid, secreted from the external surface of the human body, has been by writers most strenuously insisted

on; as if health, or it's contrary, were the necessary consequence of perspiration properly regulated, or otherwise. The fluid, which nature thus constantly separates from the blood, in greater or in less quantities, has been considered entirely as excrementitious, and necessary to be thrown off; and any obstruction, given to it, has been regarded as, in effect, the detention of so much poison in the body. Hence there is scarcely a disease known, which, at one time or other, has not been attributed to this cause. Whether the colic of Poitou can justly be referred to it, we shall now examine.

“ It has been proved, that the
“ rheumatism is one of the causes
“ of this disease. The rheumatism is
“ frequently occasioned by obstructed
“ perspiration. It follows therefore,
“ that obstructed perspiration is a
“ cause of the colic of Poitou.” The
first

first proposition not being allowed, the whole force of this reasoning is at once destroyed.

IN confirmation of this theory, the case of an healthy man is appealed to, who, having incautiously, and without his usual cloaths, exposed himself to the cold of the morning-air, was, in consequence thereof, attacked with severe pains in the epigastric region; and afterwards became paralytic in his hands and feet. The faithful partner of his bed, who had been constant and indefatigable in her attendance on her husband, likewise obstructed her perspiration; was attacked with the same colic; became paralytic; and died in convulsions. Surely a disease, which thus affected two people in the same house, must have been excited by a less general cause, than what is here supposed.

It seems indeed not improbable, that taking cold may prove an ac-

cessory, an occasional cause of this disease; where a person is otherwise disposed to it. This was the case of the painter, mentioned by M. de Haen in his first history (*ratio medendi, p. x.*) “Noctu, ob vehemens tonitru, lecto exiliens, frigori se diu ad fenestram exposuit; dein obdormivit iterum. Ex somno autem expergesfactus, intolerabilem percepit, utraque pedis in planta, ardorem, unaque octavum colicæ suæ paroxysmum.” And Citois formerly advised his countrymen of Poitou to avoid the cold and damp air of the morning; not that he seemed to regard cold air as the primary cause, but only as accessory, in cases where there was a previous disposition to the disease. A French writer therefore speaks judiciously concerning this subject. “Tout ce qu’on pourroit accorder, c’est que dans ceux, qui porteroient le germe de cette
“maladie,

“ maladie, la transpiration supprimée
 “ pourra le faire développer plus
 “ promptement qu’il n’auroit fait, ou
 “ bien rendre la maladie plus grave,
 “ qu’elle n’eût été.”

PHYSICIANS, who have written concerning the diseases of the West-Indies, have generally mentioned obstructed perspiration, as one of the principal causes of the dry-belly-ach. And the learned author of the Latin treatise, which we are now examining, in this part of his work, seems to be convinced, that the endemial colic of Surinam is to be referred to that cause. But there is a much greater appearance of probability in the opinion, which this author himself patronized in a former chapter; namely, that the endemial colic of Surinam is occasioned by the wines of Bourdeaux; which, being apt to turn sour in a very hot climate, *iniqua conservatur arte*. And the reason

alledged in that chapter, why the negroes are not infested by the colic of Surinam, namely, because they drink no wine, is much more like truth, than that, which is assigned in the present chapter; namely, that the negroes have stronger constitutions than the Europeans. And the author himself adds, that, in colonies, where the Madeira wines are drunk, instead of the French wines, this colic is not endemial. But, in fact, if it be admitted, that obstructed perspiration is a cause of the colic of Poitou; no good reason can be given, why that disease is not, in all parts of the world, nearly as common as a catarrh, or a *diarrhœa*.

THE sixth supposed cause of this colic is *the scurvy*.

WILLIS justly remarks, that the scurvy, like a condemned and infamous name, has had the scandal of most mischiefs charged to its account.

And

And it is well observed by Hoffman, that, when physicians are not acquainted with the real cause of a disease, they are very apt to accuse the scorbutic acrimony of the juices, and to hold out this cause, as a cover for their ignorance. Upon this principle, as I conceive, the colic of Poitou has, in common with many other distempers, been supposed to be of scorbutic origin.

THE Dutch seem to have corrupted the original word *schorbeck*, which signifies, in the Danish language, a disease of the mouth, into *scheurbuyk*, a word denoting pains in the belly. The former name very well expresses one of the most essential and pathognomonic signs of the scurvy. The latter does not appear to have been properly applied to it.

FOR the truth of an observation, that a colic, ending in palsy, is a symptom of the scurvy, our author
appeals

appeals to the opinion and testimony of Eugeleus; who, enumerating no fewer than forty-nine scorbutic symptoms, adds this species of colic to his immense catalogue. But, in order to determine, what degree of deference is due to the authority of Eugeleus, we ought to reflect, that it was the favourite opinion of that author, on which he frequently pays compliments to his own sagacity, that the scurvy is apt to assume the appearance of almost every known disease, acute as well as chronic. And surely the judgment of a physician is not much to be regarded, who could take a proneness to faint, in lying-in women, for a symptom of the scurvy; and who could determine the mortification in the foot, of a man of seventy years, to be scorbutic, from the black and purple spots, which appeared on the mortified part; and from the small,
weak,

weak, unequal pulse of the patient. (*See Lind's treatise on the scurvy, page 29.*)

NOR is this fact established, although we find the same observation repeated by subsequent writers. For as it has been abundantly shewn by the ingenious Dr. Lind, all succeeding writers, for a considerable time after Eugalenus, follow him religiously and minutely in their description of this disease.

THAT scorbutic patients may sometimes suffer pains in their bowels, as well as in other parts of the body, is not controverted. Nor do we contend, that even the colic of Poitou is incompatible with the scurvy. But those authors, who have been most conversant with the scurvy, and who have given the most faithful and accurate description of it, do by no means testify, that a colic, terminating in palsy, is the ordinary

nary effect of that disease, in long voyages.

DR. Lind instructs us, that the *scorbutica paralyfis* generally comes on, without any preceding colic, in the second stage of the disease; and that it arises from a contraction of the flexor tendons of the ham; and is attended with a swelling and pain in the knee. Besides, the loss of motion, to which scorbutic patients are subject, differs, in several particulars, from the palsy, which succeeds the colic of Poitou. This, for the most part, affects the upper extremities; that the lower. Then, it is observable, that scorbutic patients, although they may want strength to walk, or even to stand; yet, when in a recumbent posture, have still a power of moving their limbs. Likewise, the scorbutic palsy is not so constant and permanent; but has its changes and intervals,
and

and is apt to make sudden and momentary attacks; so that a person, who, yesterday, could not support the weight of his body, shall, to-day, with small assistance, be able to walk a little; nay, in the course of a single day, the inability to walk shall come on, and shall cease, several times. This is agreeable to what is said by Willis, in his treatise *de scorbuto*. “Affectus paralytici, scilicet
 “impotentia aut resolutio unius aut
 “plurium membrorum, item stupor
 “et formicatio sensus, scorbuto in-
 “gravescenti crebro superveniunt:
 “cujusmodi tamen symptomata, ut
 “plurimum, non sunt valde fixa et
 “permanentia; verum modo cessant
 “et remittunt, modo repetunt et in-
 “tenduntur:” Nor will there appear to be any weight in an observation, that, “in a scorbutic palsy, when
 “arising from a muriatic cause, the
 “limbs of a patient will become ri-
 “gid;

“gid; when arising from an acid
“or alkaline cause, flaccid and pen-
“dulous;” since Sir John Pringle
seems very judiciously to have ex-
cluded the muriatic, the acid, and
the alkaline causes; and properly to
have considered the scurvy as one,
simple, uniform disease, arising only
from putrefaction.

THE seventh supposed cause, men-
tioned in this treatise, is *melancho-*
lia.

THE ancients, having given to
the liver the office of sanguification,
from a mixture of the four princi-
pal humours, supposed the redun-
dance of the yellow bile to be car-
ried into the gall-bladder, and what
remained of the black bile to flow
through the *vena splenica* into the
spleen, as it's receptacle. And to
this black bile the source of many
disorders was referred. In the barba-
rous and very imperfect state of the

ancient physiology, we cannot be surprized that such a doctrine was established among physicians. But it is wonderful to find some of the moderns, at the same time that they cannot but know the foundation of such a theory to be false, through an ill-placed veneration for antiquity, not only retaining the terms *black bile*, and *atrabiliary humour*; but vainly torturing their imagination, in order to explain principles, in themselves most inconsistent and incomprehensible; to reduce into system and method *quæ in se neque consilium neque modum habent ullum*. In no part of his works is Boerhaave at greater pains to reconcile the ancient to the modern physiology; and in no part of his works does he give his reader less satisfaction *.

THE

* A few years ago I was consulted by a gentleman, who had taken many medicines, with a view to dissolve the *atra bilis*, which was supposed to appear

THE opinion of the several authors, who are here appealed to, will not appear to be of importance, if we consider, how little probability there is in the following theory; namely, “that this black bile, being out of
“it’s natural course, and penetrating
“the coats of the intestines, is transferred to the membranes of the *abdomen*; and that thus an obstinate
“colic is excited, which is to be relieved only by palsy.”

As to the instances brought to prove that grief has occasioned this colic, by having generated the black bile, they appear very inconclusive. In the first case, no better reason is given for the supposed undoubted presence of the black bile, than because the patient was affected with *urentes incute carbunculi*; and was afterwards appear as well in what he vomited, as what he voided by stool. After death, this *atra bilis* was found to be no other than blood from an ulcer at the beginning of the *duodenum*.

cured by the liberal use of the spring-juices, and spa-water. In the next history, in which a lady, who had suffered great anxiety of mind, is said to have been affected with colic pains, and to have lost the use of her fingers; the only argument here brought to shew, that black bile was the cause, is founded upon an observation, that a *diarrhœa*, occasioned by the use of saponaceous medicines, and of the fruits of the summer, was the means of her recovery.

THERE now only remains, to be examined, the last supposed cause of this colic, namely, *the passions of the mind*.

THAT violent passions of the mind are capable of exciting various disturbances in the human machine, is a fact, which can admit of no doubt. We sometimes, however, meet with histories of diseases supposed to be thus occasioned, which histories seem to

border on the marvellous, and almost surpass credibility ; so that we cannot help suspecting, that the case has been imperfectly stated ; and that some circumstances have been omitted, which, if fairly represented, would set the whole fact in a different light. We have heard of instances of the small-pox having been occasioned by a fright, when there has been no possibility of contagion ; and the most terrible effects of the bite of a mad animal have been said to have been excited by the mere passion of anger. If such histories are admitted as authentic, we can have no pretence to doubt, that anger, or sorrow, or a sudden fright, may have been the immediate cause of a disease, similar to the colic of Poitou. But still, it will be granted, that these are very extraordinary effects of the passions ; such as have not, I believe, been observed by many physicians,

physicians, even of the most extensive practice.

It is affirmed, that this species of colic often occurs in hysterical women, and sometimes in hypochondriacal men, of an irritable system of nerves. We may admit this to be a fact; and yet it will not follow, that the hysterical and hypochondriacal disease ought to be otherwise considered, than as the predisposing cause. Persons, of a delicate habit of nerves, may perhaps be particularly susceptible of impressions, made on the body by certain poisons; but it would be highly unphilosophical to infer, that the poisonous influence resides in a disposition of body, favourable to its reception. The painter, mentioned in M. de Haen's first history, after a violent fit of anger, is said to have suffered convulsions, which were succeeded by a return of his colic. In this case, the

poison, which had a long time been admitted into the constitution, in consequence of his daily employment, was, by the passion of anger, immediately brought into action ; but by no means created by the passion of anger. It was formerly observed by Citois, that the inhabitants of the province of Poitou, who had suffered anxiety of mind on account of any misfortune to themselves, or families, were particularly subject to this colic. The general cause of it had been principally attributed to the sour wine of the country ; and the passion of grief may easily be supposed to have rendered the body more susceptible of injuries from the endemial poison.

SYDENHAM, who, in his epistolary dissertation, addressed to Dr. Cole, is very copious concerning the universal influence of the hysteric disease on every part of the body ; and who

gives a particular description of the hysterical and hypochondriacal colic; informs us, that jaundice, and not palsy, is the natural termination of that disease. Whenever therefore this species of colic does happen in hysterical habits, may it not fairly be considered, rather as the effect of a latent cause, taking advantage, as it were, of such a constitution, than as the offspring of an original disease?

THUS have I examined the several supposed causes of the colic of Poitou, with a view to ascertain it's real and specific origin. It may be observed, that there are in nature various substances, as well medicinal as poisonous, which have properties peculiar to themselves; and which are distinguished from other substances by the constant and uniform changes, which they, and they only, produce in the human body. It is the peculiar operation of lead to excite a dis-

ease, most remarkably characterized. I do not venture to affirm that there does not exist another cause productive of similar effects; but, from what has above been written, it may perhaps appear, that such a supposition is not void of probability; since no other cause has hitherto been shewn to be adequate to the *phænomena*.

XVI. *Of the Bronchial Polypus: By R. Warren, M. D. Fellow of the College of Physicians, and of the Royal Society; and Physician in ordinary to His Majesty.*

Read at the COLLEGE, AUGUST 11, 1767.

POLYPOUS concretions, in different parts of the body, have been described by various anatomical and medical writers; but that species of *polypus* called the bronchial, formed in the ramifications of the *aspera arteria*, has escaped the observation of the greater number of them, and has almost always been mistaken for something else by the few who have seen it.

IN the spring of the year 1764, a young lady, eight years old, of a strumous habit, was seized with a difficulty of breathing, attended with

D d 4

a short,

a short, dry, and almost incessant cough; but without any pain in her sides or breast. During the course of the day, the difficulty of breathing and cough lessened; she rested tolerably well at night, and was free from complaint the next morning. About six weeks after this, I found her more oppressed than she was described to me to have been before: her pulse was too quick to be counted with accuracy; her tongue was white and moist; her head was clear; her bowels were costive; and she was perfectly free from all painful sensations, except that of weight on the chest. Five ounces of blood were taken away; a blister was applied to her back; and an opening draught was directed. Soon after the bleeding, the difficulty of breathing began to lessen; and after the opening draught had operated, it was still more relieved. The next morning, her breath
continuing

continuing oppressed, and her pulse beating about an hundred and twenty times in a minute, it was determined to purge her still more, upon a supposition that worms, in so young a subject, might probably be the cause of these complaints: no worms, however, came away; but after two or three copious stools, her breathing was considerably relieved. During the six following days, her pulse beat about an hundred times in a minute; and her breathing, when she was quite still, was tolerably easy; she eat heartily; coughed frequently, but without any expectoration; sweated profusely in the nights; and wasted very much. On the seventh day the extreme difficulty of breathing returned with a pulse as quick as before; but was much relieved by a dose of *oxymel scilliticum*, which made her vomit two or three times. During the four following days, she took ten drops

drops of *oxymel scilliticum* in an ounce and half of water, every eighth hour. The difficulty of breathing decreased under this course; but the pulse continued to beat more than an hundred and twenty times in a minute. In the night of the twelfth day from the attack, she waked suddenly, and was almost choked in bringing up, by coughing, a large polypous concretion. It came up without either blood or *mucus*; and instantly gave her great relief. During the two following months, she seldom passed three days without coughing up some pieces, but none so large as the first. Her breathing continued to be much affected by motion in a room; but was tolerably easy when she was sitting still, or even when she was in motion in the open air. Though her pulse never beat less than an hundred and twenty times in a minute, from the time that she began
to

to cough up the *polypi*, yet she had a good appetite; gained some strength and flesh; and entirely lost her sweats.

THIS is the history of the case from it's beginning in February 1764 to the night preceding the 28th of May following; when the quickness of pulse and difficulty of breathing returned with as great violence as ever. In the morning a larger *polypus* was coughed up than at any time before, and, in four days following, as great a quantity as in the six weeks preceding.

FROM this time the oppression on the lungs returned irregularly, after an interval of five, eight, ten, or even twenty days; but was sure to be followed by a discharge of the *polypi*. During the intervals, she seemed to make a rapid progress towards health; but when the oppression returned, she was soon reduced again. The disorder went on in this manner
till

till more than a year after the first attack; when she began to complain of a pain in her right heel. As the pain increased, the returns of the oppression became less frequent, and fewer *polypi* were thrown up. Some weeks after she had complained of the pain in her heel, it was discovered that matter was formed there; and, upon letting it out, the *os calcis* was found carious. From the time that this matter was discharged (now more than two years since) she has had no return of the difficulty of breathing; has brought up no more polypous concretions; and has been perfectly free from every pulmonic complaint. The sore in the heel has remained ever since; and a glandular swelling in the neck, which was in a state of suppuration before, and at the time that the *polypi* were thrown up, continues still to discharge.

BEFORE we describe these *polypi*, it may be worth while to observe that

that though the cause of the oppression, and difficulty of breathing was permanent, the effect was by no means so, especially at the beginning of the complaint. For it is highly probable, that the *bronchia* were in some degree plugged up with these concretions at the time when the difficulty of breathing first attacked her; though the oppression ceased without any thing being spit up, and left her well for near a month. On the second attack, in April, the vessels were more stuffed than before; yet the difficulty of breathing mended for several days before the first *polypus* was coughed up. The bleeding and evacuation by stool might probably give some little relief the second time; but, the first time, as I was informed, no attempt was made to relieve her. Did not the efforts of the lungs to throw up these concretions change the situation of them in such a manner

ner as to lessen the oppression? I suppose this to be the case; because, whenever she coughed, though nothing came up, her breathing was relieved for a time.

THE greatest number of these *polypi* are from two to three, and some four inches long.

FIGURE.

IN figure they represent very exactly a branch of the *aspera arteria* with it's smaller ramifications. At one end they are formed into a thick trunk, the extremity of which is broken and ragged; and towards the other end there is a regular ramification into smaller, and at last almost evanescent twigs. Fig. 1. 2.

COLOUR.

THEIR colour immediately, and for some days after they came up, was neither of the yellowish nor bluish cast,

To face p. 414.

Fig. I.



Fig. II.



J.V. Riemsdyk del.

P.C. Canot sculp.



cast, which is commonly observed in the *mucus* that is brought up by coughing; but of as bright a white, and as opake too, as a curd of milk.

SUBSTANCE.

SOME of them are of a much firmer texture than others, and bear shaking in water without breaking to pieces. Others are so tender, that a very gentle motion in water breaks off a great many of their smaller branches. They are solid, composed of *laminae*, which are easily separated from each other, and are manifestly of a texture less and less firm, as you approach the center or *axis*, which consists of a white pappy *mucus* as thick as cream. I observed one about the size of a quill, which was tubular. It seemed to consist of a few *lamellae* only; the inner part, making up at least two thirds of the cone, being shot out of it.

SOME-

SOMETIMES, instead of these larger portions, very small bits, of the size of peas, came up without any *mucus*; some of them very much resembled white maggots, and, I believe, have sometimes been mistaken for them. At other times small irregular pieces came up suspended in yellow *mucus*, and once or twice tinged with blood.

THESE *polypi* are specifically heavier than water, when they first come up; but, after a day two, some degree of putrefaction coming on, and part of the fixed air being let out, as is evident from the bubbles that arise, they grow lighter and swim. The fragments, while they are entangled with the *mucus*, float in water; but, as soon as that is dissolved, subside:

Two or three times, a white creamy stuff has come up, free from smell; and not unlike the soft row of a living male perch. It resembled the pap-
PY

py matter, mentioned before, contained in the innermost *lamella*, and forming the axis, of the *polypi*.

BRONCHIAL *polypi* were formerly supposed to be blood vessels. Th. Bartholine and Tulpius have fallen into this error, and have mistaken true pulmonary *polypi* for blood vessels of the lungs thrown up by coughing *: *Ramum venæ arteriosæ a Phthifico rejectum, parenchymate suo ita nudatum ac si industrius anatomicus separasset, Scultetus ad Dominum Simonem Pauli transmisit, cujus viri dono ramum cum surculis possideo. Plures ramuli capillares erant; postea idem Phthificus plures alios ramulos absque sputo sanguinis fertur rejecisse, et aliquandiu supervixisse.*

† TULPIUS, in his medical observations, tells us the following story :

* T. Barthol. cent. iii. hist. 98.

† Lib, ii. cap. 3.

Navarchus Amstelædamensis, qui diu in mari vixerat, contraxit, ætate jam maturus, ex perenni distillatione, tussim magis terra quam mari molestam. Qua per biennium flaccidos pulmones exagitante, defecit tandem viscus hoc plus nimio laceffitum; et effudit ex inopinato, non tantum sanguinem, sed præterea duos insignes venarum ramos adequantes singulos expansæ manus magnitudinem: prodibant autem separati ab omni parenchymate, ostendentes non minus distincte extrema sua lineamenta, ac si otiosus anatomicus removisset circumpositi visceris impedimentum; argumento certe evidenti totum pulmonem fuisse vitiatum, ac proinde haud mirum, excretis hisce surculis, effudisse ipsum ipsam cum sanguine vitam: at vero mirabuntur medici tantam parenchymatis dissolutionem sine prævio pure; quod ipsum forte non minus quoque mirabuntur posteri, licet nec visuri, nec lecturi

lecturi simile exemplum in ullis medicorum monumentis.

THESE two accounts do not exactly correspond with our description of the pulmonary *polypus*. The authors take it for granted that the substances, rejected from the lungs, were blood-vessels, which must imply that they had a cavity, though they neither of them express it; but the *polypus* which Bartholine says was sent him as a present, had been brought up some time before he saw it, and must have been much altered when he described it; and therefore we cannot allow him to be a competent judge. As to Tulpius, he seems to be too fond of the marvellous to chuse that they should be any thing else but blood vessels. Besides, it is evident from both their accounts, that neither of them examined them with so much anatomical precision as they ought to have done. Ano-

ther circumstance in which Tulpius's case differs from ours, is in the attachments. The larger pieces, in our case, have all of them come up without blood or *mucus*; the smaller bits have once or twice been tinged with blood, and have frequently been entangled in viscid yellow *mucus*. It is evident from hence that their attachments to the *bronchia* were extremely slight, and by vessels not large enough to carry red blood; whereas in Tulpius's case they were so strongly tied to the parts in which they were formed, as not to come up without tearing, and bringing on a fatal hæmorrhage.

Ruysch and Gretz were the first that exploded the notion that these substances were blood-vessels, and determined them to be polypous concretions, formed in the ramifications of the *bronchia**; but do not

* Epist. anatom. problemat. 6. cum respons.

say how, or of what matter they are made. Ruysch says, that he has taken them out of the lungs of the dead subject, but never saw any that were brought up by coughing; and that they differed in their appearance from blood-vessels only in not being tubular.

THERE are two instances of pulmonary *polypi* in the Philosophical Transactions, both of them said to have been hollow*: One was coughed up with so much violence, that a large hæmorrhage of the lungs ensued, and was soon followed by a fatal consumption. The other (communicated by Dr. Frank Nichols) was coughed up, in a greater or less quantity, every day for seven years; sometimes perfectly white, and sometimes tinged with blood; notwithstanding which the patient had no other complaint,

* N^o 398. p. 262. and No.^o 419. p. 123.

had a good appetite and colour, and grew very fat.

THERE is a passage in Hippocrates, in which we are told that Phericydes*, having had a pain in his right side for some time, attended with a slight dry cough, used to bring up from his lungs small white milky concretions, γαλακτώδεα; and that before he died he coughed up οἶον ἐκ μύξης μυκῆλ᾽, ξυνεσηκότα, λευκῷ φλέγματι περιεχόμενα. these substances perhaps bore some analogy to the pieces described above, that came up surrounded with *mucus*. Morgagni † is the only writer that seems to have understood this disease; and from what he has said of it, as well as the author cited before, I cannot help thinking that the complaint is more common than is generally imagined.

* De morb. popular. Lib. vii. sect. xli.

† De sedibus et causis morborum, vol. I. Lib. ii. p. 210.

THE inner surface of the air-vessels of the lungs is thick set with glands, which distill an unctuous fluid, to facilitate the expectoration of any obstructing matter, and for other purposes. May we not suppose in strumous, and in some other habits too, that these glands sometimes secrete a fluid not quite so thick as to stop up their excretory ducts, in which case they would grow hard and suppurate; but of such a degree of fluidity, as just to pass through them in a relaxed and dilated state? this supposition furnishes a sufficient quantity of matter for the formation of *polypi*. If it ouzes from these glands by little and little, or from the mouths of numberless small vessels; may it not form concretions, *lamella* after *lamella*, till the whole air-vessel is filled up? if these pulmonary *polypi* are coughed up soon after their formation, the center or *axis* of them

will be found soft, not yet having had time to be indurated ; if still earlier, they may come up hollow, the inner part of the cone not having had time to be filled ; in some cases they may be so firmly attached to sides of the vessels as not to come up without tearing, and bringing on a fatal hæmorrhage, as in Tulpius's case ; in others they may be so attached as not to be brought up by any power which the lungs are able to exert ; and the air-vessels may become so stult, that the lungs in the dead subject will appear as solid as the liver ; an instance of which is mentioned by Morgagni (*loc. cit.*) ; in others, after the formation of new concretions cease, the old ones may macerate, and a mucus coming in between them and the *bronchia* may serve as a vehicle to bring them up in little pieces, like white maggots, for some time. This happened in the case described

described above; and at first I flattered myself that the whole would come away, and that the disorder would terminate in this manner.

Is not this disorder one cause of consumptions, especially in strumous habits? do not the smaller pieces of *polypi*, if inflammation comes on, cause so many abscesses, and bring on the usual symptoms of an hectic fever? is not the best general method of relieving this complaint, when begun, or of preventing it's return, when gone, to treat it as a *scrophula*? In the case before us, the patient was not seen till her lungs were quite full: the first business was to clear them by forwarding the expectoration, which was attempted by bleeding in a small quantity, and by the common expectorants, and perhaps was assisted by them; but the *polypi* more frequently came up at dinner or supper, when a crumb of bread, or a little water,

water, had fallen into and irritated the windpipe.

INFLAMMATION was carefully guarded against, by a strict attention to diet and medicine. A decoction of the peruvian bark was taken for a considerable time: she went down to the sea, and bathed; then to Bristol, and drank the waters there. The Bristol waters seemed at first to be of service to her; and afterwards she received some benefit from lime water; but the disorder did not terminate, till matter was formed near the *os calcis*,

XVII. *On the Chicken-Pox: By Dr.*
WILLIAM HEBERDEN.

Read at the COLLEGE, August 11, 1767.

THE chicken-pox and swine-pox differ, I believe, only in name; they occasion so little danger or trouble to the patients, that physicians are seldom sent for to them, and have therefore very few opportunities of seeing this distemper. Hence it happens that the name of it is met with in very few books, and hardly any pretend to say a word of it's history.

BUT though it be so insignificant an illness, that an acquaintance with it is not of much use for it's own sake, yet it is of importance on account of the small-pox, with which it may otherwise be confounded, and so deceive the persons,
5 who

who have had it, into a false security, which may prevent them either from keeping out of the way of the small-pox, or from being inoculated. For this reason I have judged it might be useful to contribute, what I have learned from experience, towards it's description.

THESE pocks break out in many without any illness or previous sign: in others they are preceded by a little degree of chillness, lassitude, cough, broken sleep, wandering pains, loss of appetite, and feverishness for three days.

IN some patients, I have observed them to make their first appearance on the back, but this perhaps is not constant. Most of them are of the common size of the small-pox, but some are less. I never saw them confluent, nor very numerous. The greatest number, which I ever observed, was about twelve in the face,
and

and two hundred over the rest of the body.

ON the first day of the eruption they are reddish. On the second day there is at the top of most of them a very small bladder, about the size of a millet seed. This is sometimes full of a watery and colourless, sometimes of a yellowish liquor, contained between the cuticle and skin. On the second, or, at the farthest, on the third day from the beginning of the eruption, as many of these pocks, as are not broken, seem arrived at their full maturity; and those, which are fullest of that yellow liquor, very much resemble what the genuine small-pox are on the fifth or sixth day, especially where there happens to be a larger space, than ordinary, occupied by the extravasated serum. It happens to most of them, either on the first day that this little bladder arises, or on the day after, that it's
tender

tender cuticle is burst by the accidental rubbing of the cloaths, or by the patient's hands to allay the itching, which attends this eruption. A thin scab is then formed at the top of the pock, and the swelling of the other part abates, without it's ever being turned into pus, as it is in the small-pox. Some few escape being burst; and the little drop of liquor contained in the vesicle at the top of them, grows yellow and thick, and dries into a scab. On the fifth day of the eruption they are almost all dried and covered with a slight crust. The inflammation of these pocks is very small, and the contents of them do not seem to be owing to suppuration, as in the small-pox, but rather to what is extravasated immediately under the cuticle by the serous vessels of the skin, as in a common blister. No wonder therefore that this liquor appears so soon as on the second day,
and

and that upon the cuticle being broken it is presently succeeded by a slight scab: hence too, as the true skin is so little affected, no mark or scar is likely to be left, unless in one or two pocks, where, either by being accidentally much fretted, or by some extraordinary sharpness of the contents, a little ulcer is formed in the skin.

THE patients scarce suffer any thing throughout the whole progress of this illness, except some languidness of strength, and spirits, and appetite, all which is probably owing to the confining of themselves to their chamber.

I SAW two children ill of the chicken-pox, whose mother chose to be with them, though she had never had this illness. Upon the eighth or ninth day after the pocks were at their height in the children, the mother fell ill of this distemper then

then beginning to shew itself. In this instance the infection lay in the body much about the same time that it is known to do in the small-pox.

REMEDIES are not likely to be much wanted in a disease attended with hardly any inconvenience, and which in so short a time is certainly cured of itself.

THE principal marks by which the chicken-pox may be distinguished from the small-pox, are,

1. THE appearance on the second or third day from the eruption of that vesicle full of serum upon the top of the pock.

2. THE crust, which covers the pocks on the fifth day; at which time those of the small-pox are not at the height of their suppuration.

FOREIGN medical writers hardly ever mention the name of this distemper; and the writers of our own country scarce mention any thing more

more of it, than its name. Morton speaks of it as if he supposed it to be a very mild genuine small-pox. But these two distempers are surely totally different from one another, not only on account of their different appearances above mentioned, but because those, who have had the small-pox, are capable of being infected with the chicken-pox; but those, who have once had the chicken-pox, are not capable of having it again, though to such, as have never had this distemper, it seems as infectious as the small-pox. I wetted a thread in the most concocted, pus-like liquor of the chicken-pox, which I could find; and after making a slight incision, it was confined upon the arm of one who had formerly had it; the little wound healed up immediately, and shewed no signs of any infection.

FROM the great similitude between the two distempers, it is probable,
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that,

that, instead of the small-pox, some persons have been inoculated from the chicken-pox, and that the distemper, which has succeeded, has been mistaken for the small-pox by hasty or unexperienced observers.

THERE is sometimes seen an eruption, concerning which I have been in doubt, whether it be one of the many unnoticed cutaneous diseases, or only, as I am rather inclined to believe, a more malignant sort of chicken-pox.

THIS disorder is preceded for three or four days by all the symptoms, which forerun the chicken-pox, but in a much higher degree. On the fourth or fifth day the eruption appears, with very little abatement of the fever; the pains likewise of the limbs and back still continue, to which are joined pains of the gums. The pocks are redder than the chicken-pocks, and spread wider, and hardly

hardly rise so high, at least not in proportion to their size. Instead of one little head or vesicle of a serous matter, these have from four to ten or twelve. They go off just like the chicken-pox, and are distinguishable from the small-pox by the same marks; besides which the continuance of the pains and fever after the eruption, and the degree of both these, though there be not above twenty pocks, are, as far as I have seen, what never happen in the small-pox.

MANY foreigners seem so little to have attended to the peculiar characteristics of the small-pox, particularly the length of time, which it requires to its full maturation, that we may the less wonder at the prevailing opinion among them, that the same person is liable to have it several times. Petrus Borellus (*hist. & obs. rar. med. phys. centur. iii. obs. 10.*)

records the case of a woman, who had this distemper seven times, and catching it again died of it the eighth time. It would be no extravagant assertion to say, that here in England not above one among ten thousand patients is pretended to have had it twice; and wherever it is pretended, it will always be as likely that the persons about the patient were mistaken, and supposed that to be the small-pox, which was an eruption of a different nature, as that there was such an extraordinary exception to what we are sure is so general a law.

XVIII. *The Epidemical Cold, in JUNE and JULY, 1767: By the same.*

Read at the COLLEGE, AUGUST 11, 1767.

IN the very beginning of June, if not sooner, a few persons in London were affected with several symptoms of a cold; which of their own accord they in two or three days observed to differ from a common cold, and to resemble the epidemical one of the year 1762, on account of its being attended with a greater languor, feverishness, and loss of appetite, than what the same degree of such a complaint usually brings on.

ABOUT the middle of June the same disorder began to be much more common in London, and was manifestly epidemical. It was at its height about the last week in June and beginning of July, and

before the end of July had entirely ceased.

THE peculiar symptoms were a shivering, which returned frequently for the first two or three days; a troublesome and almost unceasing cough, at least for the first day or two; very acute pains in the head and back and abdomen, particularly just under the left ribs, piercing from them to the back, occasioning want of sleep. All these symptoms did not attend the same person, but most had at least one of them: lassitude, loss of appetite, and fever, belonged in some degree to all.

IN some this disorder began like something worse than a common fever, and in a day or two seemed slighter than a common cold; but many of the symptoms hung upon several at least for a week, and sometimes lasted a month. Where its attack was most violent, it brought
on

on anginas, pleurifies, and peripneumonies with a continual fever. Where it was a little gentler, the fever, though great enough at its height to bring on deliriousness, yet had plain remissions or intermissions.

It attacked equally both sexes and all ages. I saw some infants ill of it, and it appeared to be fatal to a very few old and infirm persons; but in general it was less epidemical, and far less dangerous, than the cold of 1762.

THIS epidemical illness bore bleeding very well, for it was plainly of the inflammatory kind, by bringing on, where it was excessive, inflammations of the throat, and pleura, and lungs, and such as sometimes required bleeding to be repeated. When after bleeding, or of itself, it turned to an intermittent, the bark took place, and made an effectual cure. These two remedies, together

with a few others for the relief of some incidental symptoms, were all which it seemed to want where it was bad ; but in the generality of people, it was left to nature, and cured itself.

THE season preceding this disorder was only remarkable for being unusually cold; but then it is observable, that the similar epidemical cold of the year 1762 was preceded by weather as uncommonly warm.

As the same disorder was reported to be common about the same time in many other parts of England, and more fatal than it was in London, it is very desirable, that the Physicians of those places would favor the College with what they observed relating to its history and cure.

THOUGH this epidemical illness be but just over, yet there seems no reason to apprehend any of those lasting ill consequences from it which attended

tended the sufferers in 1762, many of whom continued in a languishing state for several months, and then died; and others complained for two or three years, that its ill effects still hung upon them, and that they had not, in all this time, recovered perfectly from the hurt which it had done their constitution.

XIX. Flos Cardaminæ *recommended to the tryal of Physicians, as an antispasmodic remedy*: By GEORGE BAKER, M. D. Fellow of the College of Physicians, and of the Royal Society; and Physician to Her Majesty's Household.

Read at the COLLEGE, AUGUST 11, 1767.

A PPREHENDING it to be a principal object of the present institution of the College, to give those, who are employed in the cure of diseases, an easy opportunity of throwing out to the public whatever practical knowledge they may, from time to time, have derived from observation and experience; I am encouraged to mention to you a medicine, not often heard of in common practice, which, if I have not been deceived, has, in several instances, been used with
I success

success. I say, *if I have not been deceived*; being persuaded, that we ought not to speak with greater confidence of the success of a medicine, on the authority of a few experiments. I must likewise premise, that, in two or three epileptic cases, in which I have given this medicine, no benefit has been received from its use. Indeed, it is not to be expected, that a disease, produced by such a multiplicity of causes, should always yield to the specific powers of any single remedy. In such a disease, a medicine would be a valuable accession to our stock, which should now and then succeed, even though it should oftener be unsuccessful; “quod cum multo sæpius fefellerit, ali-
“ quando tamen etiam respondeat.”

THE medicine, which I am about to recommend to your tryal, is the flowers of our common *Ladies-smock*, *Cardamine pratensis*, *Lin. sp. plant.*
pag.

pag. 915. n°. 13. This plant grows in moist places; and flowers early in the spring. Its flower is either white, or of a light purple colour. To the taste, it is bitter and pungent. Taken into the stomach, it does not seem to have any sensible operation.

Cardamine is the σισύμβριον ἑτερον of Dioscorides. That author has given a good description of it. He says, that it is like *cardamum*; and that, it is warm and diuretic; that some used it externally as a cosmetic; and that its leaves were eaten raw.

GALEN says, that it is like the water cress, in taste and virtues.

BRUNFELSIUS gives a figure of it; calls it *herba veteribus ignota*; and adds, that the Germans killed lice with it.

TRAGUS ascribes to it the virtues of water-cress: "Urinam ciet, ventrem turbat."

FUSCHIUS

FUCHSIUS says, it is hot in the fourth degree; and talks of it's having been used as a remedy against the *sciatica* and rheumatism, on the authority of Pliny.

RAY says, it has the taste of the water-cress; but nothing of it's virtues.

LINNÆUS seems to have designed to have said something of it in his *materia medica*: for it's name is in the *index*, but not in the book.

HAVING consulted many authors, I can find the flower of this plant nowhere mentioned as an antispasmodic remedy, except only in the *pharmacologia* of Dale. And all that is said of it in that book, is,—“ flos in
“ convulsionibus laudatur ex MS.
“ Tancred Robinson, M.D.”

IN the month of January, 1763, I was consulted in the case of a young woman, who about two months before that time, being then

in her seventeenth year, had suddenly been seized with an hysterical affection, in consequence of an interruption in the menstrual discharge. Until that seizure, she had, in general, enjoyed health of body, and cheerfulness of mind. I found her pale, emaciated, and in a state of extreme dejection of spirits. Her disorder, after having tormented her in various ways, had now put on the appearance of a spasmodic *asthma*, of which she frequently suffered twenty paroxysms, or more, every day. If the returns of her *asthma* were, at any time, less frequent than ordinary, she paid dearly for such a respite, by suffering violent cramps on the muscles of the *abdomen*.

I TRIED, in succession, almost all the medicines, usually tried in such cases; but without benefit to the patient. A blistering plaster, applied between her shoulders, at a time, when she seemed

ed almost in a state of suffocation, did her evident mischief. As soon as it began to take effect, her disorder was manifestly aggravated.

DURING this distress, one of her friends recommended a scruple of *flores cardamines*, to be taken every morning and evening. I saw her after she had taken this medicine, in the dose above mentioned, six days; and was then informed, that, during the first three days, she had not received any remarkable relief; but that, from that time, she had each day suffered only three slight fits. I encouraged her, therefore, to persevere in the use of her remedy, and to increase the dose of it to half a drachm. After a month, when I visited her again, I was informed, that, during that time, she had undergone no more than ten fits of *asthma*; and that they had returned, gradually, less and less violent, without having been
suc-

succeeded by spasms of the *abdomen*. I was likewise informed, that she had lately been relieved in a natural way. She was desired to continue the use of the medicine, for a month longer. This she complied with; and became free from her complaint. I have not heard, that she has had a relapse.

ENCOURAGED by the happy event of this case, I soon afterwards gave the same powder to two patients, a boy, and a girl, both of them a little under the age of puberty, who had, for several months, been affected with the *chorea sancti Viti*; although they had taken chalybeate medicines, and the fetid gums, in great abundance; and had likewise used the cold bath. In a very short time, after they had begun to take half a drachm of this medicine, every morning and evening, they appeared to be relieved; and, in less than a month, their disorder entirely ceased.

THE

THE history, which I am going to subjoin, seems farther to shew, that these flowers are possessed of an antispasmodic virtue.

AN unmarried woman, of a delicate and valetudinary habit, was, when in her thirty-fifth year, or thereabouts, thrown into convulsions by a sudden fright, at the time of the *menfes*. These convulsions terminated in a very difficult deglutition, supposed to arise from a paralytic cause. This affection continued thirteen or fourteen years; and various medicines, which had been tried, had produced no sensible amendment. In the year 1765, she was seized with an *hemiplegia*; which, after a few hours, was succeeded by convulsions, and at once was removed. These convulsions attacked the palsied side. From that time, she seldom failed, once every month, to have a return first of palsy, and afterwards of con-

vulsions; and she performed the act of deglutition with greater and greater difficulty, after every paroxysm. In January, 1767, I ordered half a drachm of the powder of *flores cardamines*, to be taken by her twice a day. This medicine she has continued to take, from that time to the present. It is remarkable, that since she began the use of this powder, she has suffered only one slight return of her disorder. When I lately saw her, she appeared greatly improved in her general health. Her appetite to food was increased, as was likewise the power of satisfying that appetite. Indeed, in every case in which I have used this medicine, I have observed, that it has agreed well with the stomach; and that it has seemed to strengthen the digestive powers.

ALTHOUGH the last case, which I shall mention, ended less happily, yet it seems not less worthy to be communicated to the college, as well on ac-

count of the almost immediate change, which followed the use of *flores cardamines*, as of the very uncommon appearances in the body, after death.

A WOMAN, who, before that time, had in general been healthy, when about the age of twenty-four years, was affected with an obstinate *diarrhœa*. Other medicines having failed of success, this disease was stopped by the means of clysters, in which it is supposed that sugar of lead was an ingredient. The *diarrhœa* having thus ceased, there followed very frequent colic pains, and a constipation of the bowels. By degrees, she perceived her lower limbs to become weaker and weaker; and, at the end of twelve years, they had a very small power of motion remaining. During this time, her health, in other respects, did not appear to be injured; and, within the period mentioned, she had been the mother

of several children. About four years before her death, after having used the tepid bath, she perceived the first beginnings of a symptom which was afterwards most painful and obstinate. From that time, her lower limbs were affected with almost constant spasms, and various distortions; so that she was now not only deprived of all the use of the muscles of the lower extremities, but was farther distressed by having no power to controul their irregular and involuntary motions. During the continuance of these grievous disorders, the faculties of her mind were not impaired; but she very frequently complained of imperfect and indistinct vision, particularly after having amused herself with reading for a short time; and her eyes had an unnatural, glassy appearance.

VARIOUS medicines, of the anti-spasmodic character, were opposed to
this

this complicated disorder. But it was soon observed, that the fetid gums, the root of the wild valerian, volatile salts, musk, and camphor, all which had been tried both separately, and combined with one another, had not only no good effect, but that the disease was even aggravated by the use of them. Opiate medicines produced uncertain effects. Sometimes a small dose of *confectio Damocratis* was sufficient to procure for her a quiet night. At other times, she required forty or fifty drops of *tinctura thebäica*; which quantity, at other times, seemed only to disturb and to irritate the whole system of nerves, and to add violence to the spasms.

UNDER these circumstances, one drachm of the powder of *flores cardamines* was ordered to be taken by her every morning and evening. This dose was afterwards increased to a drachm and half, thrice a day. Before

she had taken this medicine a week, it was evident, that her spasms were less violent; her spirits calmer; and that her sleep was less disturbed.

SHE persevered in the use of this medicine two months; and, during that time, appeared every day to have received some benefit; except only at the time of the *menfes*, when the medicine was not taken. At that time, she always appeared more than commonly irritable; and her spasms were more violent and painful. But while we were entertaining some hope of her life being rendered less miserable than it had lately been, she was seized with a fever, and died in a few days.

ABOUT twenty-four hours after her death, we were permitted to examine the body. The *cranium* being opened, it was observed, that the *dura mater* was much looser on the brain,

brain, than what is common; and that it appeared, as if the brain was lessened and contracted, and had shrunk from under its covering. Both that membrane, and the *pia mater* were found. The cortical substance of the brain was in a natural state, as was likewise the external part of the medullary substance, especially that which formed part of the convolutions. But all the internal part of the medullary substance, which is called *centrum ovale*, containing the *corpus callosum*, *corpora striata*, *thalami nervorum opticorum*, &c. and more especially the most central part of each hemisphere, was of a much firmer consistence than natural. The lateral ventricles contained about the quantity of a large spoonful of bloody *serum* between them. The *glandula pinealis* contained a small bit of a gritty substance. The *cerebellum* was affected in a similar manner with

the brain ; that is, the cortical substance was without any morbid appearance, whilst the medullary substance was sensibly firmer and tougher than usual, but not to such a degree as that of the *cerebrum*.

THE *medulla oblongata* was smaller than natural, and of the same kind of tough and firm consistence with the *centrum ovale*, and in the same degree.

THE *medulla spinalis*, in it's whole length, was in the same condition with the *medulla oblongata* ; that is, remarkable for its smallness, and for the firmness and toughness of its texture, having entirely lost it's pulpy consistence. Indeed it was so tough, as to allow of being twisted like a rope.

THE nerves derived from the *medulla spinalis* had nothing uncommon in their appearance. But the dissector imagined, that all those
nerves,

nerves, which went off from the brain, the third pair excepted, were smaller than natural. But of this fact he could not be sure, except only with regard to the optic nerves, which were contracted to half their natural size. They were hardly larger than the third pair of nerves.

It was observed, that this firmness and toughness of the medullary substance of the brain, of the *medulla oblongata*, and of the *medulla spinalis*, was different from that firmness, which had been found in the brain of several maniacal subjects, which had been lately dissected. In the latter, a firmness only or hardness, without toughness, appeared, corresponding with the description of the brain of several persons, who died under a *mania*, recorded by Morgagni, in his book *de causis et sedibus morborum per anatomen indagatis*.

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IN the *thorax*, the lungs adhered to the right side: but nothing else was found diseased in that cavity.

IN the *abdomen*, the omentum adhered to the liver. The liver bore marks of some old inflammation; for its coat, from the *peritonæum*, was thickened, and was harder than common. The spleen was of a large size; and had also marks of an old inflammation. The *ovaria* contained little sacs of coagulated blood. This person having died soon after the menstrual period, the vessels of the internal surface of the *uterus* were found still turgid. All the parts, not mentioned, were in a natural state.

HERE then it seemed sufficiently manifest, why this woman's disorder had been so intractable. At the same time, it was satisfactory to reflect, that in a body, so diseased

diseased in the most important part of it, some small relief had appeared to have been derived from medicine.

P. S. *Since the first edition of this volume, I have seen several instances of the good effect of flores cardamines in convulsive disorders,*

XX. *An APPENDIX to Dr. BAKER'S
Inquiry concerning the cause of the
Endemial Colic of Devonshire.*

SINCE an *inquiry concerning the cause of the endemial colic of Devonshire* has been printed, I have received several articles of important intelligence on that subject; which are here subjoined.

DR. Ingen-houfz, not being entirely satisfied with the information, which he received, when he was at Rouen, has inquired of a physician of that place, by letter, concerning the method of making cyder in Normandy; and particularly whether there be any disease in that province, which may be supposed to be the effect of the provincial liquor. In answer to his queries, he has received
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an *analysis* of two dissertations, which were lately read before the academy of Rouen, by M. Chaudelier, a celebrated chemist of that city; from which *analysis* what immediately follows is extracted.

“ Dans Roüen, il n’y a gueres ou
 “ point d’années, où il n’y ait des
 “ coliques, qui attaquent ordinaire-
 “ ment les domestiques par prefe-
 “ rence, et en plus ou moins grand
 “ nombre dans les mêmes maisons :
 “ ce qui fait presumer qu’elles sont
 “ occasionnées par le cidre, qui est la
 “ boisson ordinaire des domestiques.

“ Aux mois d’Aoust et Septembre,
 “ 1766, les maitres de plusieurs mai-
 “ sons de consideration aiant beau-
 “ coup de leurs domestiques attaquées
 “ de coliques, engagerent un chy-
 “ myste, de nôtre academie de Roüen,
 “ à examiner et analyser leurs cidres,
 “ pour tacher de decouvrir la cause
 “ de ce desordre. Il fit avec zele et

“ defintereffement l'examen de ces
“ cidres ; et comme ils avoient un
“ gout agréable d'abord, qui laiffoit
“ cependant apercevoir enfuite un
“ aigre et un acerbe, qui affectoit la
“ bouche d'une efpece d'aftriktion et
“ fecherelfe, il commença par s'affurer
“ de la prefence de l'acide ; &c.

“ Mais foupçonnant, que les ma-
“ ladies qu'on lui attribuoit, venoient
“ de quelque chaux de plomb, et
“ craignant que l'ufage pernicioeux de
“ quelques marchands de vin ne fe
“ fut communiqué à quelques mar-
“ chands de cidre, il ne negligea au-
“ cun des moiens propres a s'affurer
“ de la prefence du plomb.

“ Le foye de foufre arfenical, l'eva-
“ poration a ficcité, et la calcination
“ avec des matieres abondantes en
“ phlogiftique, furent employées ; et
“ malgré une attention fcrupuleufe,
“ à n'enlever les cendres que par le
“ moien de lotions, il n'y trouva pas
“ le moindre atome de metal.

“ IL

“ IL ne conclût pas pour cela, que
 “ le cidre n'étoit pas la cause des
 “ coliques regnantes ; mais comme le
 “ cidre étoit doux et aigre, melangé
 “ de cidre vieux et nouveau, ce qu'on
 “ appelle ici *cidre coupé*, et ce qui
 “ est fort en usage, il conclût que
 “ le *cidre coupé* caufoit des coliques,
 “ et étoit d'un usage dangereux.

“ On attribue donc au cidre les
 “ coliques qui regnent ici de tems en
 “ tems ; mais on ne voit gueres ou
 “ point de paralysies, qui en soient
 “ la suite.

“ PRESQUE toutes les auges circu-
 “ laires, où l'on ecrafe les pommes,
 “ sont de bois, et jointes avec des
 “ chevilles, sans aucun metal. Il s'en
 “ trouve cependant quelques unes
 “ qui sont construites de pierres, et
 “ sur tout de grais, creusées exprès et
 “ mises bout à bout, dont les jointures
 “ sont garnies de plomb.

LA faiselle ou plancher du pres-
 “ soir, sur lequel le suc des pommes
 “ s'écoule,

“ s’ecoule, est par tout nôtre canton
“ fait de bois, sans aucune plaque
“ de plomb.”

It is fairly then to be inferred from the testimony of M. Chaudelier, that the colic, which, from time to time, infests the inferior class of people in the province of Normandy, is not analogous to the colic of Devonshire; since “ on ne voit gueres
“ ou point de paralyfies, qui en soient les suites.”

It may likewise be concluded, that if we even suppose, what however is not proved, that the Norman colic does now and then end in a paralytic affection, such cases may reasonably be referred to lead, as the cause of that disease; since, although wooden troughs be in general used in Normandy, it is acknowledged by M. Chaudelier, that
“ il s’en trouve quelques unes, qui
“ sont construites de pierres, dont
“ les

“ les jointures sont garnies de
 “ plomb.”

My opinion therefore, concerning the cause of the colic of Devonshire, seems to be greatly confirmed by the experience of the inhabitants of Normandy.

It was hardly expected, that the practice of lining cyder-presses with lead would ever have been defended, as a practice not at all likely to be productive of mischievous consequences. But it has been supposed, that the pernicious qualities of lead cannot possibly be extracted by the liquor as it flows from the press; there not being sufficient time for it thus to receive a metallic impregnation. Such an argument has even zealously been urged, in opposition to the authority of a decisive experiment above-mentioned, as well as to the testimony of the learned Dr. Wall. But I have received other posi-

tive and circumstantial accounts, from parts of England, where this disease is not endemial, which confirm both the validity of the experiment, and of Dr. Wall's observation: and it has been particularly remarked, that, in that part of the county of Dorset, which adjoins to Somerset, the colic of Poitou is a frequent disease; and especially in those parishes, where the custom of lining the cyder-presses with lead most generally prevails.

DR. NOOTH, who communicated to me this, as a certain fact, knows a Gentleman, resident in the neighbourhood above-mentioned, who uses no lead in the *apparatus* for making cyder, and whose family has never been affected by the colic of Poitou, although his servants drink largely of that liquor.

ANOTHER piece of information, which I have received from a Gentleman of the county of Dorset,
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is really most alarming. "It is," says he, "a common practice among our farmers, to buy, at the apothecaries shops, large quantities of sugar of lead, with which they are known to sweeten their cyder." It is hoped, that such a pernicious practice will be abolished, as soon as it is known, what are it's certain and necessary consequences.

I AM informed likewise, that, in several of the cyder-counties, a leaden pipe has sometimes been contrived for the purpose of conveying the new cyder from the press to the cellar: and I could relate more instances than one of the colic's having by such means been occasioned among all the servants and labourers of a farmer, to whom that disease had entirely been unknown, before the introduction of the leaden pipe. But it is presumed, that to endeavour to corroborate what has already been offer-

ed, by farther evidence, would only be *uti in re non dubia testibus non necessariis.*

WITH respect to the opinion, which has prevailed, that the four unripe cyder is the cause of this provincial disease, such ground cannot be maintained, unless (what has not hitherto been done) it can be shewn, that there is any where to be found an acid liquor of a similar poisonous quality, whether drunk in its unfermented, or fermented state, or in the act of fermentation. For what probable reason can be imagined, why the apple-juice, of one part of this island only, should be possessed of such a baneful peculiarity, such an exclusive privilege of being thus pernicious? But, in fact, every step, which I have taken in this inquiry, has tended to confirm and to illustrate my idea, that the malady, in question, owes it's origin partly to a variety of accidents,
and

and partly to fraud; causes, which will easily be obviated, when once men have divested themselves of those prejudices, by the means of which that plain and direct path, which leads to truth, has been darkened and obstructed; and an error, most detrimental to society, has become inveterate.

XXI. QUERIES: *By* Dr. W. HERDEN.

Read at the COLLEGE, AUGUST 11, 1767.

I. **T**HE peruvian bark has been given to a woman successfully in the quantity of a drachm every three hours, two days after her delivery, for twenty-four hours, without lessening the lochia; and it has been frequently given to others during their catamenia without the least interruption of them.

IN the confluent small-pox, a very free use of it has not seemed in a variety of cases to have abated the spitting. Is there any just foundation for believing the bark to be so powerful an astringent, as to obstruct
any

any natural or critical evacuation, and thereby endanger the health; or to make us fear giving it upon these accounts, whenever there is any other good reason for its being given?

II. DOES experience sufficiently warrant that virtue sometimes ascribed to camphor of preventing a strangury? Two scruples of it given to a woman in a clyster proved so irritating as to bring on pains resembling those of labour. Another woman was seized with a strangury soon after she had taken a camphor bolus, which she herself imputed to the camphor, and no other probable cause of it could be assigned. Camphor is in its nature nearly allied to spirit of turpentine, one drachm of which taken internally brings on a strangury, as certainly as cantharides.

III. SE-

III. SEVERAL patients labouring under eruptive fevers, who have happened to keep out of bed a little time every day, for several days together, have constantly found, that the eruption was greater, while they were up and cool, and that it began to fade as soon as they were hot in bed. Is it owing to experience or hypothesis that eruptions are believed to be thrown out more vigorously by warmth and lying a-bed?

IV. Is the gout so certain a remedy of other complaints as it is generally supposed? and is it not a much worse evil than most of those for the cure of which it is often desired?

V. PALSIES and apoplexies, which are only different degrees of the same distemper, most commonly attack those who are past the meridian of life, and frequently such as are at
3 least

least upon the verge of old age. They are often the distempers of persons worn out with cares, and diseases, and time, and seldom of the young and vigorous, and of the subjects of inflammatory disorders. The medicines likewise hitherto established by experience to prevent their returns are almost all, except the purging ones, of the stimulating and cordial kind. Is not all this sufficient to make us suspect, that mischief may be done by an indiscriminate use of large bleedings for all who are struck with such complaints? Books do indeed make a distinction between a pituitous and sanguineous apoplexy, in the latter only of which they recommend bleeding: but this difference is not easy to be seen, and seems hardly ever looked for in practice. Wherever the state of health was such, that there would have been just objections to taking away blood before the attack

of a palsy or apoplexy, there, in my opinion, there will always be a good reason, if not against bleeding at all, yet certainly against taking much blood, after such an attack; and accordingly some apoplectic patients have appeared to me to have been hurt by large and repeted bleeding.



END OF VOL. I

